CALIFORNIA
OIL WORLD

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Wyoming
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TWICE
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OVEMBER
1957

0th Year
Vol. 50
No. 21

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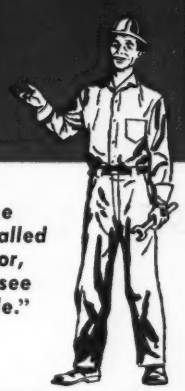

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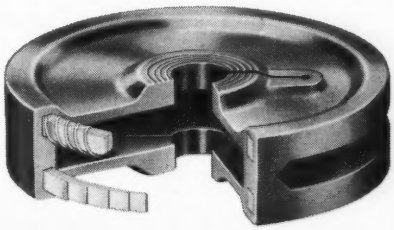

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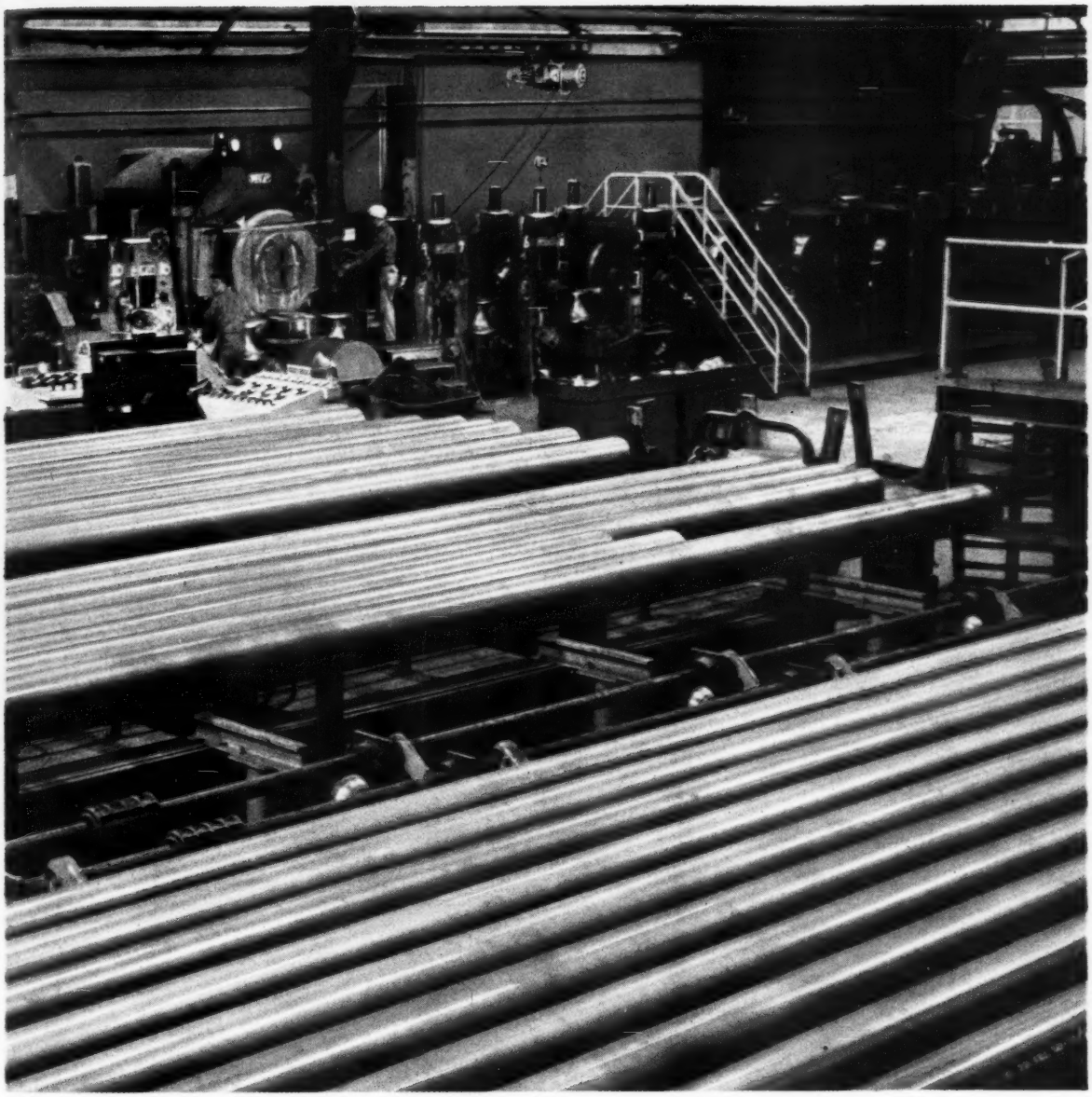

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November 15th, 1957

Offshore Oil Production Needed Adjunct To Current State Output

Until offshore exploration and development get going at a substantial rate, crude oil production in California probably will hover somewhere around 930,000 barrels a day.

Largely because of a burgeoning population in the whole Pacific Coast region, California refiners are being called upon more and more for additional products to satisfy consumptive demand.

This situation has resulted in the importation daily of several hundred thousand barrels of crude oil into the state to augment refinery runs.

A new source of oil supply will be opened next spring when the 750-mile pipeline from the Four Corners to Los Angeles is completed.

For the entire country, the American Petroleum Institute estimated 1958 domestic demand at 9,200,000 barrels daily, up 3.3 per cent over the current year.

Compare this with 1859, the year when the first commercially successful well was drilled at Titusville, Pa., and during the 12-month period only about 2000 barrels were produced over the entire nation.

Basic Quality

Leafing through any page of history discloses no chapter citing comparable growth of the petroleum industry and its obvious leadership in easing all aspects of life. With character the basic quality of the oil fraternity, it is no great surprise that the industry has extended its searches to every nook and cranny to affect added comforts generation after generation through the wonders of thousands of products ensuing from crude oil.

The Petroleum Age, published in Bradford, Pa., in its December, 1881, issue in part had this to say about members of the industry:

"If all other branches of American industry exhibited a similar state of progression, in the arts and sciences (pertaining to their respective necessities) in so short a time, it could truly be said that America was leading the world in its industrial pursuits.

"But it is a pleasure to note this remarkable advancement in the production of our important staple. In no other business, perhaps, are there so many men of genius, so many men of pluck, enterprise and determination to win engaged as in the oil business.

Energy Applied

"While in other countries where petroleum has been obtained in greater or less quantity for ages there appears to have been no improvement made in the method of boring or sinking wells, the oil producers of this country have applied energy and genius to their efforts, and as stated, in the short space of 20 years they have succeeded in revoluntionizing the entire system of operating for oil.

"There is not in use today of similar pattern so much as a single tool, from the wrench up to the boiler and engine, that was use by the early drillers.

"Even the derrick, though it retains a resemblance, is no more the derrick of 20 years ago than a 10 year old boy is a full grown man. The same may be said of all the other auxiliary implements.

"Whereas 20 years ago three and six months time was exhausted in drilling a well not more than 400 or 500 feet deep, wells are now sunk 2000 feet deep in 25 days."

This sage comment was in the first issue of the "Age," which said that the oil industry of America was the only one up to the present time that has not been represented by a journal wholly devoted to its interests.

Then as now the industry was guided by extreme prevision, ingenuity, constant research and a disposition to take a risk to bring about the full usefullness of petroleum.

Speaking of risks on the financial side, California operating organizations have already expended many millions of dollars in preparing for their respective drilling campaigns along the coast.

There is no assurance as to what they may find in the way of oil seaward, a fact which offers no deterrent to expenditures in gearing to drill wells beneath the ocean floor. It will be some years before it is definitely known what the pay off will be on ocean exploration.

Another branch of the industry to watch is petrochemicals. This division has accounted for everything from cosmetics to paints and on the horizon are hundreds of other products stemming from the alliance of petroleum with chemistry.

At any rate, 1958 should be highly interesting for the California industry, which lies in an area showing a faster growing population than anywhere else in the world and consequntly in need of more petroleum products.

The Geochemistry of Uranium and Lead—Age-Datin

W. JACQUE YOST
The Ohio Oil Co., Littleton, Colo.

The Age-Dating of Rocks

One of the outstanding achievements of geological science has been the determination of the time at which events took place during the past history of the earth. The petroleum geologist, especially, has attempted to determine when a particular rock was first deposited, when it was altered, and when it first occurred in the present state in which he now finds it when he takes cuttings or cores from a wildcat well. By means of these time measurements and the comparison of times, he then compares the few samples he has taken from his wildcat well with samples taken from another area in which the amount of information discovered may be much greater. Consequently, the determination of the time at which all of these things happened to the rock, or the age-dating, as it is commonly called, becomes very important to each petroleum geologist.

A great many methods for determining these times or ages have been developed throughout the history of geology. The methods themselves have been improved and refined until today it is possible to determine a great deal of the history of any particular sedimentary basin. The most prominent method, paleontology, consists of identifying the fossil remains of plants or animals contained within the rock. Inasmuch as various plants and animals are known to have lived at certain periods, the rock can be dated by means of these fossil remains. Other methods used by the geologist depend upon the rate at which various geological processes, such as sedimentation, take place.

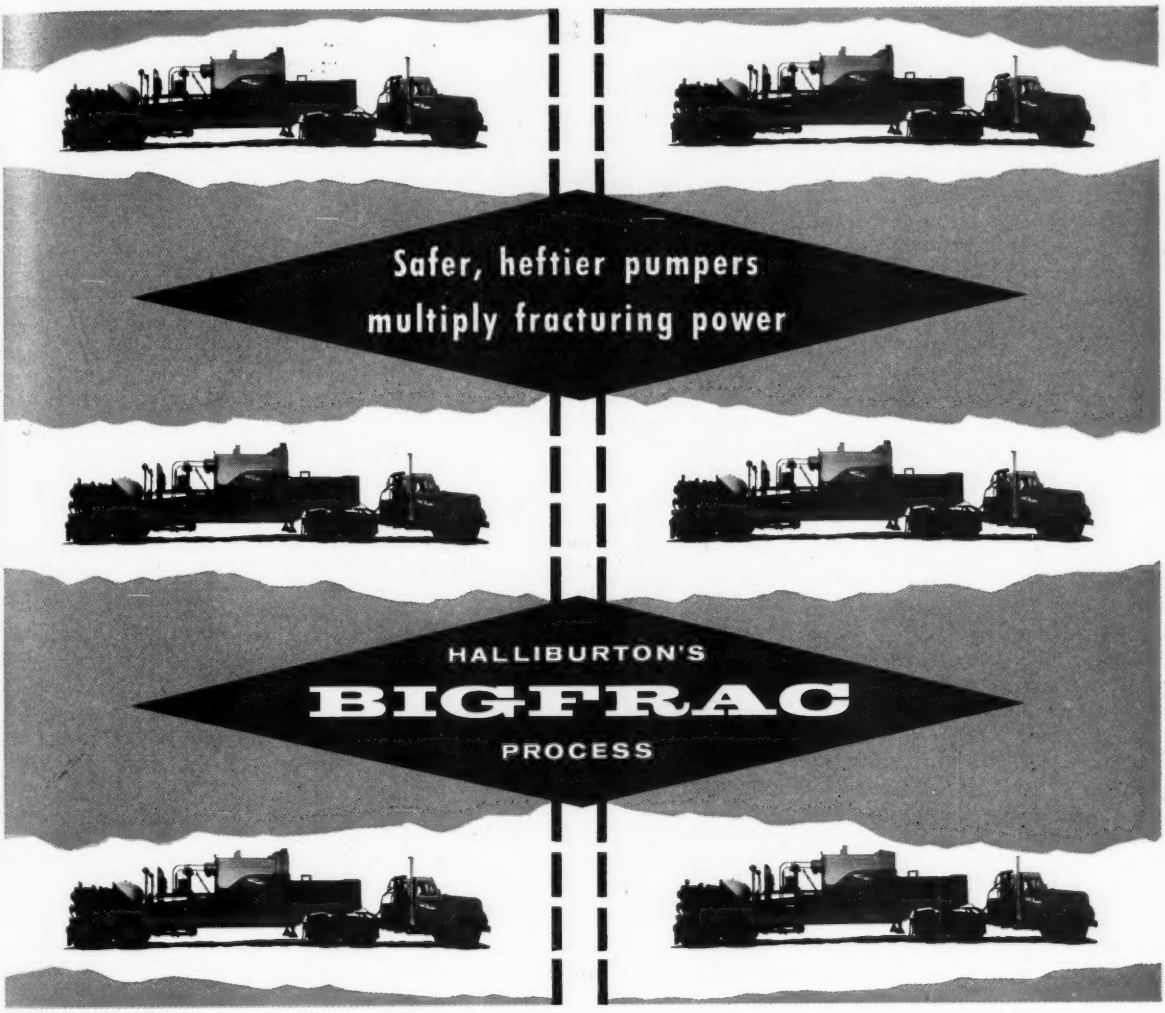
Radioactive Time Measurement

However, since the discovery of radioactivity, there has been a strong belief among experts that the use of radioactive materials could provide a more accurate and more reliable geological clock for the measurement of such time. The basis for a radioactive time measurement is simply the fact that certain elements which occur throughout the earth's crust decay radioactively into other elements at fixed rates. These rates are independent of practically all physical and chemical processes which can be assumed to have occurred during geological time. Consequently, the amount of material which has been transformed by this radioactive process is determined only by the length of time involved. Furthermore, the rates at which some atomic species decay are so slow that a sample weighing only a few grams, which started decaying at the time of the formation of the earth, is still decaying today at a rate which can be measured.

In the early decades of this century, the only elements investigated were uranium and thorium. It was soon discovered that both uranium and thorium decayed into other elements. This process continued through many steps, finally ending with one of the isotopes of lead. Also, during this process of transformation from uranium or thorium into lead, helium was being created. Consequently, it was possible to follow the course of this radioactive decay by means of the measurement of either lead or helium. In many cases the helium, being a gas, was not completely retained within the mineral or rock being analyzed. The same type of problem occurred when a measurement of the lead was attempted. In this case, during the process of decay from uranium or thorium to lead, one of the intermediate products formed was radon, a gaseous material. During the existence of the material in the form of radon, there is a possibility of escape of the radon gas. This is simply one of the errors one encounters in trying to determine ages by use of these methods. However, the most serious problem encountered during the early days of this work was that of the analysis of lead itself. It was impossible to assume that all of the lead measured in the sample originated from the thorium and uranium. Consequently, very accurate analytical procedures to determine the elemental uranium, thorium, and lead were developed during the first few decades of this century.

During the 1930's after the discovery of the neutron, a great deal of fundamental research was started concerning the nature of isotopes. In particular, it was found that two isotopes of a single element differed only in the number of neutrons contained in the nucleus. All of this work on isotopes involved the construction of more accurate mass spectrometers, which were the instruments devised for the measuring of isotopic abundances. With the use of these new mass spectrometers, it was possible not merely to measure the total amount of uranium, thorium, and lead in a sample but to measure the amounts of specific isotopes of these three elements. This increased precision of measurements and better understanding of the processes involved formed the beginning of the present science of dating geological samples by means of radioactivity. This work was placed on a good foundation by the work of Professor Nier of the University of Minnesota. During the 1930's, Professor Nier not only designed and built several excellent mass spectrometers but, between 1939 and 1941, published a series of papers summarizing much of the work on geological dating by radioactive means.

Although World War II interrupted most age-dating work, it did produce better mass spectrometers as well as a number of people with the necessary training and interest to start age-dating research again at the close of the war. In addition to a renewed interest in the thorium and uranium processes, three new processes were studied, with the thought that they, too, might offer geological time clocks. These new processes were the decay of radioactive potassium to calcium, the decay of radioactive potassium to argon, and the decay of radioactive rubidium to strontium. Thus, in the early 1950's when the API Advisory Committee on Fundamental Research on Occurrence and Recovery of Petroleum was considering the support of research in this area, six processes were available for the determination of the age of geological samples. Although a great



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deal of reasearch was being conducted on all of these methods, most of the studies pertained to very old, igneous rocks. It was believed that possibly Institute support would encourage more research in the age-dating of sedimentary rocks, which are the rocks of primary importance to the petroleum geologist. In order to understand why most research workers preferred to work with older, igneous rocks, it is necessary to review briefly some of the analytical problems involved in a radioactive age determination. Each of the 5 radioactive isotopes, uranium 238, uranium 235, thorium 232, potassium 40, and rubidium 87, decays or is transformed into a stable isotope of some other element. The number of atoms decaying or transforming in a given length of time depends only upon the number of atoms of radioactive isotope in the sample, or, in other words, a certain percentage of the sample will decay or be transformed in a given length of time. In the case of uranium 238, which is fairly typical, 1 per cent of the sample will decay to lead 206 in the first 65 million years. One per cent of the remaining sample will decay in the next 65 million years. This exact relationship will continue ad infinitum. Consequently, the older the sample, the more lead 206 it will contain and the easier will be the analysis of that lead 206.

The second factor which must be considered is that the 5 radioactive isotopes previously mentioned are extremely rare in the earth's crust. In fact, in order to perform the analysis at all, the researcher usually must look for minerals which contain one of these five isotopes in fairly large proportions. Most minerals of this type are more common in igneous rocks than in sedimentary rocks. The final factor differentiating the study of sedimentary rocks from that of igneous rocks is the basic nature of sedimentary rocks. Most sedimentary rock is formed by the weathering of older rocks or by the precipitation of atomic mixtures which have been redistributed by the solution process. Hence, many workers believe that age determinations of sedimentary rocks will yield reliable dates only if the research work combines the studies of the pertinent radioactive and sedimentation processes. All of these objections are certainly valid. What they really say is that the problem of age-dating sedimentary rock is much more difficult than that of dating igneous rock. Just how difficult the problems are and what answers can be obtained will only be determined by very careful, precise research studies.

The API Advisory Committee on Fundamental Research on Occurrence and Recovery of Petroleum deemed it advisable to encourage research in this particular field. In 1955 they established API Research Project 53, "Age-Dating of Sedimentary Rocks," at the California Institute of Technology (Cal Tech). In addition, they established an API grant-in-aid at the University of Chicago, also in 1955. Project 53 has been running continuously since that time, first under the direction of Prof. Harrison Brown and more recently under the direction of Prof. Claire C. Patterson. [In June of this year, the title of Project 53 was modified to "Geochemistry of Uranium-Lead Systems (Age-Dating)."] Project 53 is simply one part of a broad program of research relating to the radioactive decay of uranium. Other aspects of the program are supported by Cal Tech and the Atomic Energy Commission. In addition to an excellent staff, the laboratory at Cal Tech has available some of the finest mass spectrometers in existence. The laboratory has been especially designed and controlled to keep contamination to a minimum and is equipped with sensitive and precise analytical equipment.

Inasmuch as it is possible for the lead in a given sample to come from many other sources, in addition to the radioactive decay of uranium and thorium, it is necessary to be very careful about two phases of such research work. In the first place, every possible source of lead other than the sample under investigation must be eliminated, insofar as possible. In the second place, the sample itself must be studied from many points of view. In the case of the sedimentary rocks, this means studying the broad sedimentary processes and the relation of uranium, thorium, and lead to such processes.

Sedimentation Studies

In the beginning, work at Cal Tech was primarily concerned with samples of igneous rock and meteorites. However, since the inception of Project 53, a greater proportion of the time and effort has gone into studies relating to sedimentation. Three major projects, or parts of projects, have been started, relating directly to the processes involved in sedimentation. This first project has been designed to determine the uniformity of the distribution of uranium, thorium, and lead isotopes in the oceans of the world. The first question to be answered is how uniform is the distribution of these various elements. Secondly, it is important to know exactly what that distribution is in quantitative terms. For instance, if the composition of a given ocean is extremely uniform, it could then be assumed that the mixing taking place in that ocean is extremely good. If this is true, then it could be assumed that similar mixing had taken place in the past; consequently, the composition of the ocean water with respect to lead, uranium, and thorium isotopes would be quite similar to the composition of the sediments deposited or precipitated from that ocean. The project has completed this study in enough detail to indicate that this mixing is extremely good in any one ocean. It has also progressed far enough to say that the concentrations in the Atlantic and Pacific oceans are significantly different. It is hoped that further research may uncover some of the reasons for the differences between these two oceans. For those interested in sedimentation, one very interesting byproduct of this research is the method used to obtain samples. The amount of lead, uranium, or thorium in ocean water is so small that the collection of a suitably sized sample from the water itself would be extremely difficult. However, it has been discovered that manganese nodules on the floor of the ocean, which are formed by precipitation from the ocean water, tend to concentrate uranium, thorium, and lead in a very excellent, thorough, and uniform fashion.

The second phase of the work in sedimentation age-dating involves the determination of the relative amounts of these three elements in beach sands collected from all over the world. This phase of the work has not progressed to the stage of yielding any significant results in terms of the correlation of the compositions from different sands. However, it has indicated that certain types of sands contain enough of these elements for satisfactory analysis, whereas others do not.

The third phase relates to the Leadville, Colo., limestone in an area where a large intrusion and secondary mineralization have occurred. The uranium

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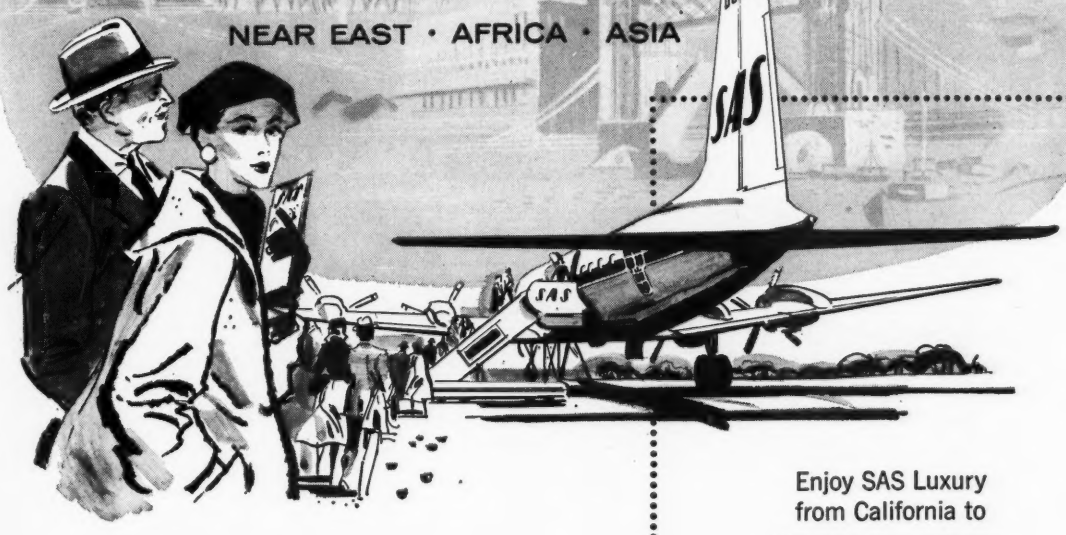

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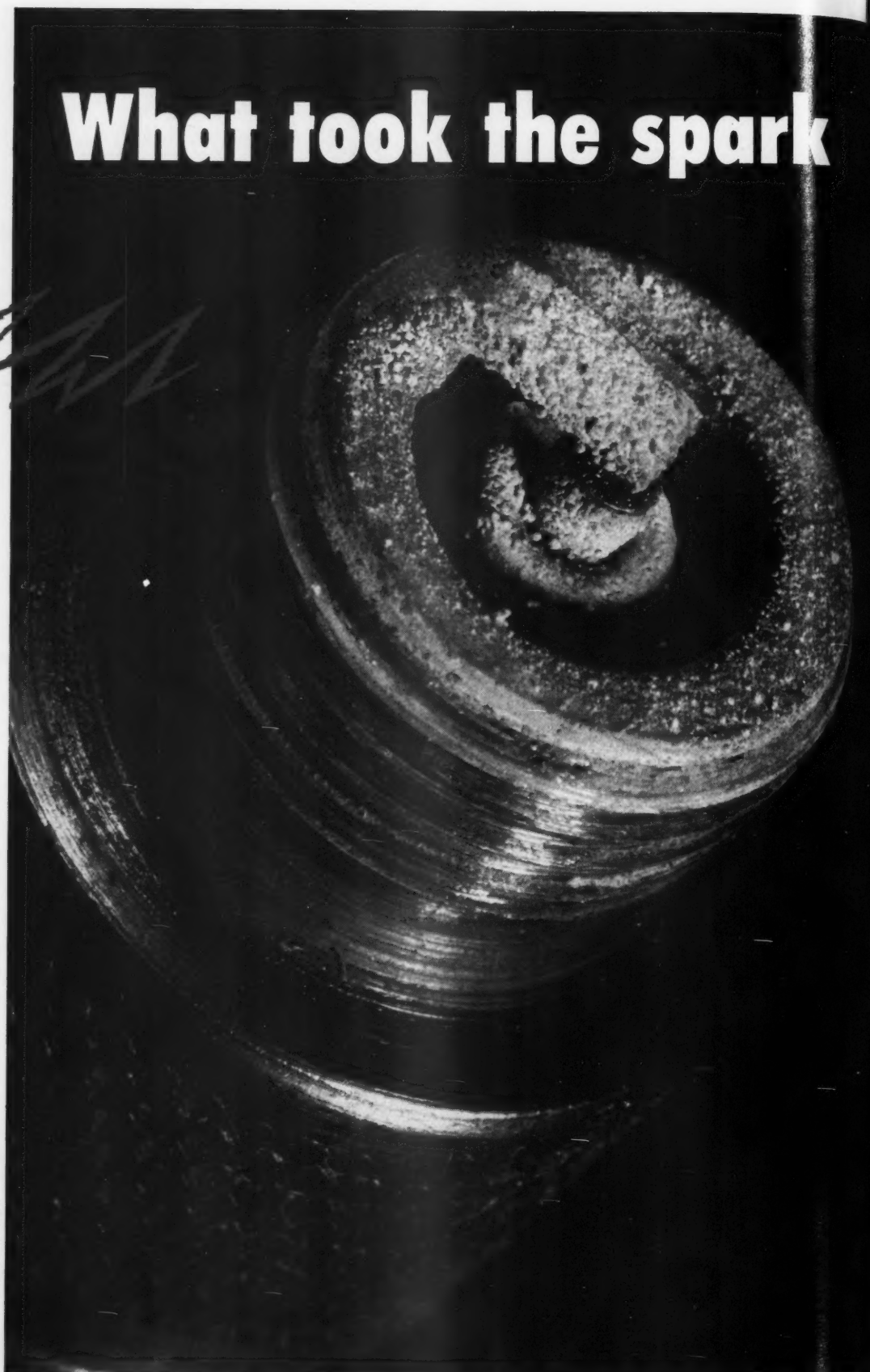
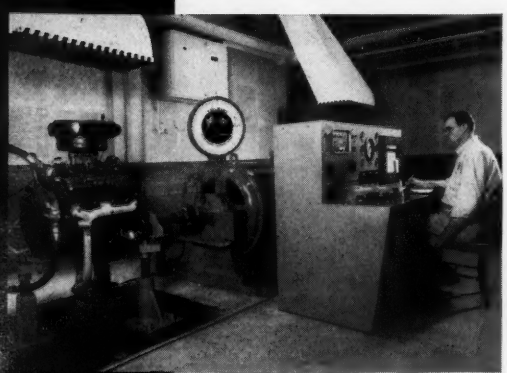


This unretouched photograph, taken by Edmund F. Hawes, UOP Staff Photographer, was awarded First Prize in the 1956 ASTM Photographic Exhibit.

out of this plug?

The old problem of the fouled-up spark plug is less acute today because of modern improvements in petroleum refining. Most refiners are taking the utmost precautions to make sure that the motor fuels they produce burn clean, quick and with the full power needed for today's high compression, high-speed engines. Throughout the refining industry research technicians are constantly checking the fuels their refineries produce to help guard against plug fouling and to maintain all the high performance characteristics demanded by today's automotive engines. In this way they are helping to make and keep the products you market salable. Here at UOP, in our business of developing processes for the manufacture of motor fuels, we also never take our eyes off the performance of the end product. Our research and technical staffs are constantly concerned with the fuels made by UOP processes to make sure that these will have the performance qualities that will give their ultimate users full satisfaction. This is only part of the broad contribution research is making toward the salability of products from petroleum. Wherever you market, you can be sure that "men of science" are constantly working to keep the products you sell at the quality level your customers demand.



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and thorium studies of Project 53 on these samples are being closely tied in with the paleotemperature work being performed by another group of research people at Cal Tech. At the present stage of this work, it can only be concluded that there are significant differences in the uranium, lead, and thorium content in the various known samples. Of greater significance, perhaps, is the fact that the limestone body far removed from any intrusions does contain enough lead to make a satisfactory mass-spectrometer analysis. However, this amount of lead is orders of magnitude less than that dealt with in the earlier studies. Consequently, it has been necessary to restudy all analytical procedures in order to reduce the lead contamination from other sources.

A good example of the contamination problem is evident in this work with the limestone samples. These samples contain about half as much lead as 1 cu m of Pasadena, Calif., air. In addition, a great deal of contamination is carried in by workers on clothing, shoes, and so forth. Furthermore, enough lead is dissolved from Pyrex glass during the entire analytical procedure to present a severe contamination problem. At the time of the last meeting of the Research Project 53 Advisory Committee, most of these contamination and analytical difficulties had been resolved to the point where the limestone samples could be analyzed with reasonable precision. This work will continue at Cal Tech and members of the committee are expecting more interesting results as time goes on.

Work is also progressing at many other institutions in an attempt to use radioactive potassium and radioactive rubidium as geological time clocks. Each of these various radioactive processes has certain inherent advantages and certain inherent disadvantages. In large part, the choice of the particular radioactive process to use hinges upon the type of sample which one can obtain. The really fundamental questions concerning the distribution of radioactive elements during the deposition of sediments can probably be answered by the use of any one of the techniques. The American Petroleum Institute expects that the work at Cal Tech will provide useful and fundamental information concerning uranium and thorium as time clocks in sedimentary processes. Furthermore, it will encourage other workers to use similar methods in order to evaluate potassium and rubidium for the dating of sedimentary processes.

Presented to a session on fundamental research during the 37th Annual Meeting of the American Petroleum Inst., in the Conrad Hilton Hotel, Chicago, Ill., Nov. 11, 1957. This paper was sponsored by the Advisory Committee on Fundamental Research on Occurrence and Recovery of Petroleum; presiding, Committee Chairman J. E. Sherborne, Union Oil Co. of California, Brea, Calif.

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By Richard Sneddon

Geoscientific Types

Exploration scientists in a remote sort of way bear a remarkable resemblance to people. In the main they are well informed. Indeed, they have to be to reach the educational heights that are essential to an accredited status in the petroleum industry. But, having been graduated, some are a trifle timid in the matter of reaching clean-cut decisions. Others are brash to the point of daring. And then there is a heavily preponderant group, as nearly rationalistic as anyone can be in a business that, despite many significant advances, is still highly speculative. Illustrative of professional reticence is the case history, cited by Graham Moody, former Standard of California economist, later a consultant of note. The doubtful hero of Graham's yarn was a quiet, bashful geologist who had worked with the same company for 30 years and had never been known under any circumstances to stick out a prognosticative neck. He did at last become wildly excited over the findings on a certain piece of property. So much so that in a spasm of recklessness he not only advocated its purchase but further suggested that several wells be drilled on it without delay.

Backward and Brash

All of these proved to be drier than a Caledonian on Hogmanay, and as a result the reluctant oil finder was given the American equivalent of the **putsch.** When he had sufficiently recovered from the shock he went to his boss and, with tears in his eyes, begged to be taken back. "I've learned my lesson," he said, "and if you'll just give me back my job, I promise—so help me—that I'll never recommend another play as long as I live!" A classic story, featuring the confident, self-assured type, is told by C. Alton Jones, chairman of the Board of Cities Service Company, somewhat as follows and to wit: The central figure is a consulting geologist, whom one of the lawyers in an important suit, was attempting to qualify as an expert witness. "Do you have any academic background?" he asked. "Oh,

there's a Hercules tubing head

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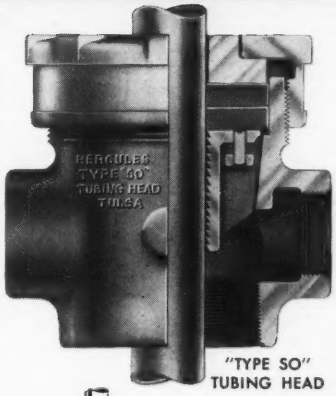
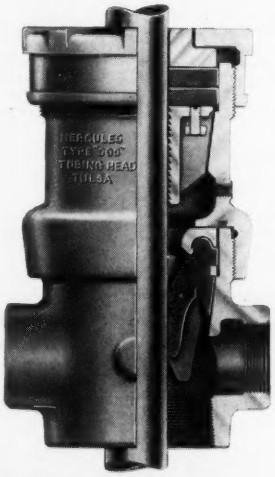
HERCULES "Type SO" Tubing Head is particularly suited for pumping due to compactness (only 12½" high). Stripper rubber can be used in body for running or wiping tubing. Also ideal for intermittently flowing wells.



"TYPE SO" TUBING HEAD

HERCULES "Type SO" and "SOS" Tubing Heads are the favorite of successful operators because of their simplicity, ruggedness and ease of operation. Available in 4½" OD to 7" OD Casing Sizes to suspend 2", 2½" or 3" tubing. Constructed from pressure cast steel and tested to 4,000 PSI. Slips are hinged for ease of installation and positive alignment.



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HERCULES "Type SOS" Stripper Tubing Head is unsurpassed for use in well servicing operations as well as on flowing wells. It consists of a HERCULES "Type SO" Tubing Head with a bowl and Neoprene Tubing Stripper.

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yes," replied the witness, "as a matter of fact, I majored in geology and was graduated with the highest honors ever recorded in college history."

The World Champ

That's wonderful," went on the questioner, "and what is your professional standing here in the United States?" "Well," said the modest one, "I've been president of A.A.P.G.* and G.S.A.*; I am credited with the discovery of several of the largest oil fields in the United States; I have written and lectured widely on all phases of the subject; and I believe I can say with due modesty that I am considered the finest geologist in this country." "And what about internationally?" continued the barrister. "Oh," said the witness, languidly, "the situation is about the same there. I have been active in practically every oil producing area on the globe as a consultant; have become internationally recognized as an authority on all aspects of oil finding; and am undoubtedly at the moment world leader in the geological field." When he came down off the stand, one of his friends buttonholed him and chided, "Say you certainly stuck your neck out, telling the court that you were the greatest geologist in the world." "Well," said the expert, still unabashed, "I had to—I was under oath!"

*American Association of Petroleum Geologists
*Geological Society of America

The Edge Lands

In recent years, the increasing interest in the continental shelf has developed new exploration techniques that are adding real drama to the finding business. Especially exciting in this respect is the submarine geologist—a dashing adventurer who dresses himself in a rubber suit and fins, attaches an air supply to his back, adjusts his breathing apparatus, and nonchalantly does a back somersault into the water. (He may, of course, jump or be lowered into the water if the

TIDEWATER INVESTS
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In every phase of the petroleum business, Tidewater is on the move.
The Tidewater refinery in Avon has giant, new facilities that produce the cleanest-burning gasoline in the West.
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Tidewater
is on the move!
Tidewater Oil Company
FLYING A SERVICE

circumstances are not right for a backflip entry.) Thereafter, he forages about the ocean floor with waterproof instruments, seeking the same sort of pertinent data as does his landlubber counterpart on shore. Thus he aids in the preparation of geological maps, the placing of geophysical equipment, or any thing that might contribute to the exploration program.

The Offshore Search

The geophysical folk have been particularly active in the the search for favorable offshore sites. They have really gone to sea in a big way, with fleets of vessels replacing the conventional rolling equipment. They have, of course, had to adjust their procedures and instrumentation to the new environment. It has been necessary, for example, to develop appropriate shooting methods. This has been somewhat complicated by the need to strike a happy medium between a shock wave of sufficient intensity to produce clear seismic signals and one that will exercise a negligible effect on the fish fauna in the shooting area. However, by dint of some nice cooperation between fish and game authorities and the geophysicists, methods satisfactory to all concerned have been prescribed.

The Three Mile Limit

All of this offshore excitement has created considerable general interest in that marginal strip of ocean, known as "the three mile limit," which was originally a protective band for the lands on which it borders. The definition of the strip took place away back sometime in the historical past when the maritime nations began to think seriously about their vulnerability to hostile attack from the sea. They decided that in the interest of national security their natural territorial limits should be extended some distance oceanward. At the time these deliberations took place, the greatest distance that could be reached by cannon fire was about three miles, so it was assumed that a three mile strip of water would offer adequate protection to any land having an ocean front. The idea received international approval and has prevailed ever since.

The Continental Shelf

There is a tendency to confuse the three-mile limit and the continental shelf, but whereas the former is a strip defined by international law and relatively unchanging, the latter is a quite irregular sub-marine plain of variable width. The two, of course, may co-incide for an indeterminate fraction or for all of their extent but in either case it is a matter of accident and not design. The continental shelf lies mostly under shallow water, not more than 100 fathoms deep, and at its outer edge slopes swiftly toward the ocean deeps. The three-mile limit is measured seaward from the mean low-tide mark.

Other Geophysical Devices

Referring again to the activities of the geophysicist, please note that he is not confined solely to the use of the seismograph. On occasion he may employ a gravity meter which he will calmly tell you "determines structural features on the basis of areal anomalies in the gravitational field of the earth." You will remember that Isaac Newton was forced to the discovery of gravity when he was sitting under an apple tree and a falling Pippin smacked him on the bean. The word "gravity" comes from the Latin **gravitas,** meaning "weight," and weight, of course, is the pull that keeps things from falling in any other direction excepting towards the center of the earth. Now this pull varies slightly according to the distance one is away from the earth, and according to the density and arrangement of the rocks between the point of measurement and the earth's center.

The Gravity Meter

An "anomaly" is simply an irregularity, indicated by some change in measurement, and is exactly what the operator is searching for. "Areal" is "area" turned into an adjective and implies that both the anomaly and the place where it shows up are important. So, the ingenious geophysicist has perfected a meter to record the magnitude of the difference in gravitational pull at any point above, on or below the earth's surface. By taking enough measurements at properly oriented locations and studying them in conjunction with other related facts, he can come up with all sorts of valuable deductions. A nice thing about the geoscientist's work is that even negative indications are valuable. It may sometimes be more important to know that there is no oil underground than it is to prove the presence of it. This contention may be debated but it can't be denied that a small initial find may eventually cost an operator more than a dry hole would have done. The gravity meter, incidentally, is especially suited to the finding of salt domes and a number of important oil reservoirs have been found under this type of formation.

The Magnetometer

Another instrument that is used effectively by the geophysicist is the magnetometer. This one consists essentially of a finely balanced magnet that measures the magnetic pull of the earth from any given point. Its utility is based on the fact that all rocks do have some degree of attraction although in certain ones the pull is very slight. It takes its name from Magnesia, a district in Thessaly, Greece, where early historians noted a so-called lithos or "stone" that attracted metal. All the meter suffixes, of course, are from the Greek metron, "a measure." The magnetometer is an elecronic device; can be used to distinct advantage in areas where there are successive sub-surface layers of varying attraction; and is of such simple construction that it can be suspended from a plane and can thus survey wide areas, without harm to its mechanism or sensitivity.

Resistivity and Stuff

Classed under the heading of geophysics are several other methods which are based on certain electrical properties of rocks, such as resistivity, natural flow of current, etc. These are very definitely for discussion by brain trusters and I would be daring indeed to attempt any sort of elucidation. However, with my usual facul-

ty for running down interesting inanities, I note that the unit of resistance is the "ohm" which takes its name from G. S. Ohm, a German physicist. The thing that is interesting about this is that the unit of conductance which is the literal reverse of resistance is given the reverse title "mho." Ducedly clever these physicists. What! And while we are on the subject of "electricity," the word has quite a history, too! The resinous exudations of certain trees, after hardening, have long been used like precious stones in rings, bracelets, and other articles of both masculine and feminine adornment. The hardened substance, which we know as "amber," was found to have unusual qualities. When rubbed briskly it attracted scraps of paper, repelled other things; and generally behaved in a most peculiar way. The Greek word for amber was elektron and that in Anglicised form we adopted to express the mysterious power with which amber is endowed—electricity.

Weight of Experience

It must be obvious by this time that the effectiveness of most exploration apparatuses is dependent almost entirely on the accumulation of operating experience. The correlation of instrumental results and geological data is a form of progressive rationalization that goes on indefinitely and becomes easier and surer with the passing of time. Modifications and improvements are constantly being made both in device and method of interpreting results, and these inevitably, even if slightly, enhance the value of the process. Maybe some day, before the driller ever spuds a well he'll know exactly what he is going after and exactly where it is.

The Scientific Yen

Reams of fantastic copy have been written about noted scientists by word-inebriated publicity men. They would have us believe that practically all industrial genius needs for its fullest expression is a laboratory full of weird glassware and Goldbergian contraptions, preferably well hidden from the later but meantime it should be prying eyes and eternal questioning of the lay people. We are asked to accept the legend that a Steinmetz or an Einstein works endlessly in a sort of prepossessive daze that quite ignores such mundane matters as recreation and remuneration. Oh, maybe, once in a long time the brain may startle his sponsors by requesting nutbar money but usually he is too deeply immersed in fancies and formulas to be aware of hunger pangs or, indeed, any of the other functionary cravings that ordinarily pester the human anatomy. Although there is no discounting the progress that has been made by these burrowing researchers, they sometimes become so intent on a specific aspect of a problem that they overlook quite obvious and very important facts.

The Universal Solvent

Illustrative of this is a bewhiskered story that I first heard at school in Scotland. It concerns an ambitious young chemist who, immediately upon graduation from college, went deep into the forest and built a laboratory. Here for six months or so he worked in complete isolation. Then, one day an elderly farmer came nosing around the place, and since by this time the chemist was feeling just a mite lonesome, he invited the old chap in. After looking the place over, the farmer remarked, "You know, I just can't understand why a fine young fellow like you should be living in such total seclusion. Just at an age when you should be cultivating people, here you are hiding yourself away from everybody and everything. What's it all about?" "Well," replied the chemist, "when I was at college I had a terrific idea and I'm now trying to work it out. I am trying to develop a universal solvent—something that will dissolve everything." "Say, that is a wonderful idea," agreed the old boy, "but have you given any thought to what you will keep it in when you get it?"

The World Is His Oyster

There are still plenty of geoscientists tucked away in laboratories and doing yeoman service for their respective professions. We shall discuss these interesting to observe that the type of experience to which most petroleum exploratio[illegible]sts are now subjected is produ[illegible]ing a brand new kind of tech[illegible]cal wizard. This one is no rec[illegible]use. On the contrary, he is a da[illegible]ng, resourceful, adventurous c[illegible]ap, a vertiable trail blazer who, travel-wise, makes Marco Polo look like an old stay-at-home. He carves his nonchalant way into steaming jungles, scorning the danger of tropical diseases, wild beats, and hostile natives. He is undismayed by the frozen wastes of the Arctic or the searing sands of Saudi Arabia, and would probably with equal unconcern conduct a survey on some metropolitan Broadway at noon, if that were necessary to forge a missing link in the chain of his logic.

Isolation No Problem

Actually, he is not much worried about the conditions that might prevail when he reaches his work outpost because one of the features of modern exploration technique is that it provides the survey crews with the proper environmental conditions. Living in isolated areas is an art that the geo-scientist has perfected as meticulously as he has his methods and equipment. Airconditioned trailers, refrigeration, power generators, radio, and electronics, have taken a lot of the hardship out of remote operation. Distances have been so telescoped by the speed of flight that at the worst a survey crew can scarcely be more than 24 hours from its home base, and with the growing use of helicopters and parachutes, it won't be long until the word "isolation" is superfluous, at least in this connection.

Affront and Retribution

Certainly it would seem that no area or medium is now beyond the reach of the oil finding people. Surveys are made in the air, on the land, on the sea, and even on the ocean floor. The distant areas of the world are drawing closer to us with every passing minute. Field equipment of prospecting parties today not only includes the instruments and accessories with which to secure the requisite

(Continued on Page 33)

HOLDS PRESSURES Automatically

GUIBERSON Type E TUBING STRIPPER

FOR LOW AND MEDIUM PRESSURES

Low in height and compact, this new Guiberson stripper speeds up running or pulling tubing because it seals automatically. Rubber requires no tightening or adjustment. Cup-shaped rubber is specially designed to be tear resistant — specially compounded to resist damage from oil, gas or well fluid. Reinforced with steel wires and bushing.

Bayonet-type latch on cover plate makes it easy and quick to remove or install rubber. Handles lock the cover on the body. Cover plate accommodates Guiberson Tubing Spider. Body may be tapped for two 2" side outlets on special order. Pressure rating, 750 p.s.i. working pressure, 1500 p.s.i. test pressure. For 2", 2½" and 3" tubing, and for flange sizes 6"-400, 6"-600, 6"-900, 8"-400 and 8"-600.

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Personalities IN THE NEWS

New Halliburton Head Is Logan D. Campbell

Halliburton Oil Well Cementing Co.'s new chairman of the company is Logan D. Campbell, formerly vice-chairman. He succeeds Erle P. Halliburton, founder, who died October 13.

Logan D. Campbell

Company directors meeting October 22 named Campbell to the top post and elected one new director, Ray O. Shaffer, president of a Halliburton subsidiary, Welex, Inc. (successor to Welex Jet Services, Inc.).

All other officers and directors were reelected.

Halliburton's new chairman attended the University of Oklahoma's School of Business and was engaged in banking until joining Halliburton in 1926. Successive posts have included assistant secretary, treasurer, secretary-treasurer, financial vice president and vice-chairman of the company.

Campbell is a trustee of the Halliburton Employees' Benefit Fund (the company's retirement plan) and director of Halliburton Oil Well Cementing Co. and Halliburton Oil Well Cementing Co. Ltd. (Canada).

AAPG Officers Elected for 1958

The following officers were elected by ballot to head the Pacific Section of the American Association of Petroleum Geologists:

President—U. S. Grant, IV.

Vice-President—Thomas A. Baldwin.

Secretary—George Y. Wheatley.

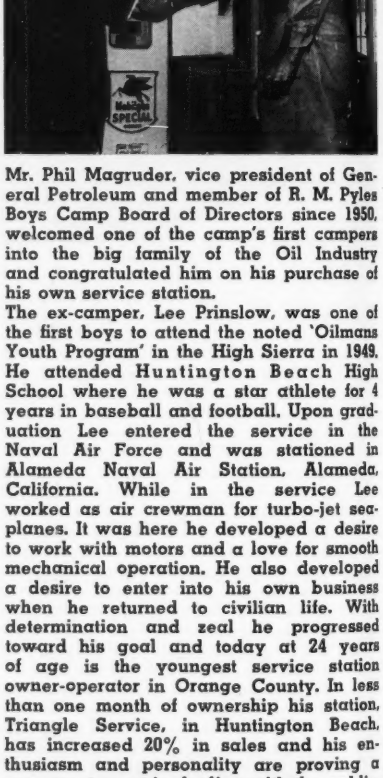
Treasurer—Robert R. Knapp.

Mr. Grant is Professor for the department of Geological Sciences at the University of California, Los Angeles; Mr. Baldwin is Senior Geologist for the Monterey Oil Company, Los Angeles; Mr. Wheatley is District Geologist for the Superior Oil Company, Los Angeles, and Mr. Knapp is a Geologist for the Standard Oil Company at Los Angeles.

Their term of office began immediately following the A.A.P.G., S.E.G. and E.E.P.M. Convention at the Ambassador Hotel, Los Angeles, California, November 7 and 8, 1957.

Former President Truman during his recent stay in Los Angeles took in the Los Angeles Rams-Chicago Bears football game as guest of Oilman Ed Pauley, longtime friend and part owner of the Rams.

The American Petroleum Institute's "Gold Medal for Distinguished Achievement" was presented November 11 to Dr. Warren K. Lewis of Newton, Mass., professor emeritus of chemical engineering at Massachusetts Institute of Technology. The presentation was made at the Conrad Hilton Hotel in New York before an audience of oil men, engineers, scientists, and representatives of government, business and industry generally. MIT is the seat of learning of many California oil men.



Mr. Phil Magruder, vice president of General Petroleum and member of R. M. Pyles Boys Camp Board of Directors since 1950, welcomed one of the camp's first campers into the big family of the Oil Industry and congratulated him on his purchase of his own service station.

The ex-camper, Lee Prinslow, was one of the first boys to attend the noted 'Oilmans Youth Program' in the High Sierra in 1949. He attended Huntington Beach High School where he was a star athlete for 4 years in baseball and football. Upon graduation Lee entered the service in the Naval Air Force and was stationed in Alameda Naval Air Station, Alameda, California. While in the service Lee worked as air crewman for turbo-jet seaplanes. It was here he developed a desire to work with motors and a love for smooth mechanical operation. He also developed a desire to enter into his own business when he returned to civilian life. With determination and zeal he progressed toward his goal and today at 24 years of age is the youngest service station owner-operator in Orange County. In less than one month of ownership his station, Triangle Service, in Huntington Beach, has increased 20% in sales and his enthusiasm and personality are proving a very great asset in dealing with the public. Mr. Magruder, always interested in progressive young men, visited with and offered his personal good wishes and congratulations to Lee. Mr. Magruder says, "This is another example of the success of our fine deserving boys whom we are trying to help in our Pyles Boys Camp program."

A year-round follow-up program is now in effect with the Pyles Boys Camp and its two fulltime men are continuously helping and counseling with the ex-campers. Helping secure part-time jobs is only one of the many responsibilities the camp organization assumes for its boys.

Ottinger Advances At McCullough Tool

Mr. Newton H. Ottinger, former Division Logging Engineer for McCullough's Mountain Division, has been appointed Sales Manager for McCullough Tool Company's Four Corners District, according to an announcement by Mr. I. J. McCullough, President.

Newton H. Ottinger

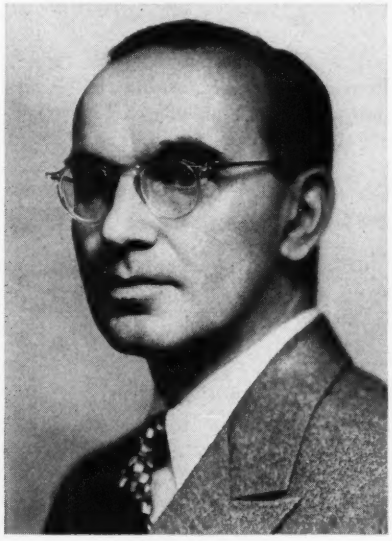
A graduate of the Missouri School of Mines and Metallurgy, Rolla, Missouri, Ottinger received a Bachelor of Science Degree in Civil Engineering with additional work in mining and mine electricity in 1937. Prior to joining McCullough in 1955, Ottinger was Senior Geophysicist for Sinclair Oil and Gas Company, and prior to that, was employed by Schlumberger Well Surveying Corporation for 16 years, attaining the position of district manager of their Gulf Coast and Mid-Continent districts.

Mr. Ottinger will make his headquarters in McCullough's Four Corners District Office in Farmington, New Mexico and will supervise sales in the portions of New Mexico, Arizona, Colorado and Utah which comprise the Four Corners District.

The Magruder Elementary School at Torrance, named after General Petroleum's executive vice president, P. S. Magruder, is expected to be ready for occupancy by September, 1958.

Galloway Named Executive Vice President at Shell Oil Company

The Shell Oil Company board of directors designated A. J. Galloway an executive vice president of the firm.



A. J. Galloway

Galloway has been vice president in charge of Shell's exploration and production activities since 1948. He will continue to be responsible for this phase of the Company's business.

The new position recognizes the increasing importance of exploration and the production of crude oil and gas, according to H. S. M. Burns, president of the Company.

Galloway joined Shell in California as a geologist in 1926. He had been exploration and production vice president for the mid-continent and later for the Texas-Gulf area and the east of the Rockies territory before being made vice president in charge of the Company's nationwide exploration and production operations. He has been a director of Shell Oil Company since 1953.

D. B. (Bud) Arndt has been named sales representative for Cardwell Manufacturing Company in the Four Corners area and headquarters will be maintained at Durango, Colorado.

Kenneth C. Crawford of Shell Oil Company, who was recently transferred from Whittier to the Bakersfield area, is making his residence in Stockdale.

W. E. (Bill) Childers, pictured above, is the new field sales representative for the Grant Oil Tool Company and its subsidiary, the MacClatchie Manufacturing Company, in Venezuela. Childers was in the employ of Gulf for 20 years and after his retirement served in the Houston and Compton branches of Grant. He will maintain offices in Maracaibo and Barcelona.

Jim Bailey and Del Pyle have moved from Union Oil Company's headquarters at Coalinga to the office in Bakersfield. Bailey is production foreman at Arvin, and Pyle petroleum engineer in Bakersfield.

L. E. J. Brouwer, Shell Oil Company managing director in Holland, visited both Farmington and Durango during his recent inspection tour of Shell holdings in the United States. He was particularly impressed by the phenomenal growth of oil development at the Four Corners. Sam F. Bowlby, Shell Pacific Coast vice president, and R. R. Robison, head of the company's production department in the Farmington district, were on hand to greet the guest from the Netherlands.

President Bob Minckler of General Petroleum has been reelected to the National Industrial Conference Board. The election was held at the board's annual meeting at the Waldorf-Astoria in New York.

The Winter Frolic of the Oil Landsmen's Wives will be held the evening of December 13 in the Fiesta Room of the Hacienda Hotel in Bakersfield, according to Mrs. Durland Clark Jr., chairman.

Simpson Named California Sales Manager For Fluid Packed Pump

Simpson

L. B. Cook, California Division Manager for Fluid Packed Pump Co., announces the promotion of Mr. Grey Simpson to the newly created position of California Sales Manager, effective October 1, 1957.

For the past twelve years Mr. Simpson has taken an active part in developing the sales and service of Oilmaster products in the Los Angeles Basin area. He is well known by oilmen in the Long Beach, Santa Fe Springs and Huntington Beach communities. Mr. Simpson is an active member of the Toastmasters, Petroleum Production Pioneers, and A.P.I.

Wendell G. Markham, pictured above, has joined Tretolite Company of California division of Petrolite Corporation as a research chemist. For the past eleven years Markham has been associated with BJ Service, Inc. in the capacity of chief chemist working in the fields of oil well cementing, production, stimulation, and corrosion.
Markham received his BS degree from Colorado State and his MS degree from Oklahoma A & M.

L. S. Fuller, widely known member of the oil fraternity, has been named drilling superintendent for El Paso Natural Gas Company in the San Juan Basin of Utah.

Charles E. Finney, 67, former president of the Salt Lake Pipeline Company and Salt Lake Refining Company, died at his San Mateo, California, residence. Before the two Salt Lake companies were formed in 1947, Finney was vice president in charge of industrial and labor relations for Standard Oil Company of California.

Harold D. Hoopman, new operations manager of the Ohio Oil Company of Guatemala, was formerly superintendent of uranium exploration at the Casper, Wyoming, division of the parent concern, Ohio Oil Company.

Directors of the new Hess Oil Company at Fresno include T. B. Hess, E. A. Fritz and Jean Foster. Headquarters of the company are in the Helm Building at Fresno.

Appointment of Morriss C. Foster of Salt Lake as secretary-treasurer of Paradox Production Corporation has been announced. Foster is assistant manager of Pacific Northwest Pipeline Corporation's land department. Richfield Oil Corporation and Utah Southern Oil Company hold interests in the 28,000-acre Dirty Devil block held by Paradox in Wayne County, Utah.

Appointment of Art Hawkins, pictured above, as division manager for H. C. Smith Oil Tool Co. has been announced by Arthur S. Marshall, vice president — sales. Mr. Hawkins will make his headquarters in Ventura, California. He joined the company in 1947, and in 1953 was appointed branch manager. Last June he was made assistant division manager.

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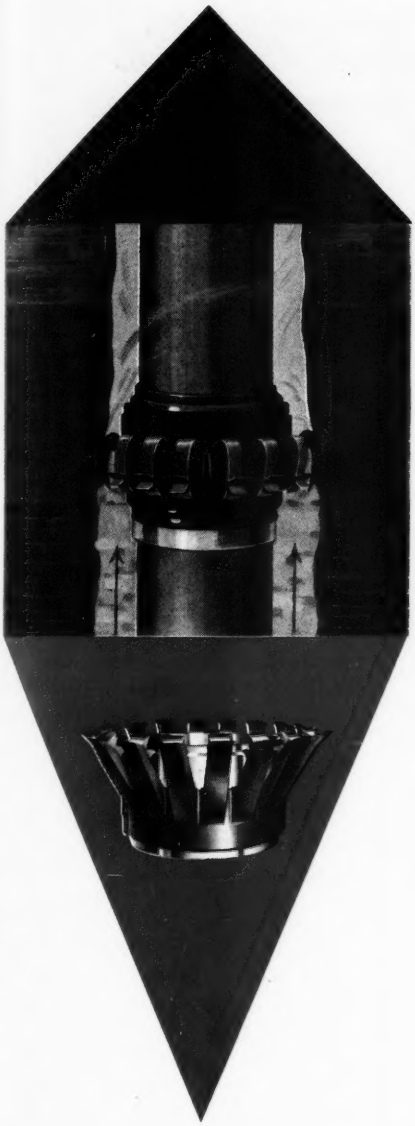


HALLIBURTON'S NEW
RECIPO WALL CLEANERS

Provide...

★ Better Bonding of Cement

★ More Efficient Removal of Filter Cake

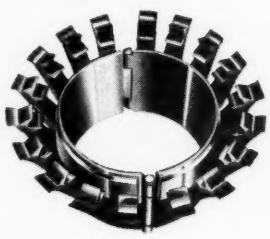
★ Less Cement Channeling

The Halliburton Recipo Wall Cleaner aids in effecting better bonding of cement to the formation and casing by removal of filter cake as casing is reciprocated.

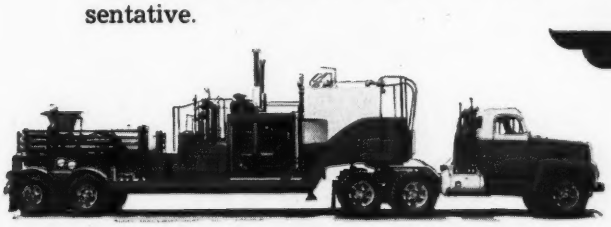
The Recipo Wall Cleaner, with wide, tough claw-like rubber fingers molded to a steel collar, is hinged for easy installation on the casing. The design of the cleaner permits freer passage of cuttings, lost circulation materials and viscous fluids. The rubber fingers minimize possible bore hole or filter cake damage while running casing, yet are sufficiently rugged to clean the wall thoroughly and effectively at desired points when casing is reciprocated.

ADVANTAGES OF THE RECIPO WALL CLEANER INCLUDE:

- Wide fluid passage areas between fingers reduce circulating pressures and bridging action of filter cake cuttings, with or without lost circulation materials.
- Wide cleaning fingers clean more bore hole area . . . aid in breaking up channeling action of cement through drilling fluid.
- Increased velocity of fluid circulation between rubber fingers scours the walls of the hole for better cleaning.



A four-page bulletin describes and illustrates the Recipo Wall Cleaner in greater detail. For your free copy, contact your nearby Halliburton field representative.



HALLIBURTON OIL WELL CEMENTING COMPANY

DUNCAN, OKLAHOMA

251 SERVICE CENTERS – JUST MINUTES AWAY FROM ANY WELL

Field Development

Fruitvale Field Adds Production

The Campbell Company's KCY No. 3-21 well on Section 21-29s-27e in the Fruitvale field is in on the pump from a total depth of 3938 feet for a last reported yield of 65 barrels of net 22.8 gravity oil a day. The Upper Kernco was topped at 3888 feet. The drilling chores were handled by McNee Drilling Company.

Ojai Test Ready To Dig

All set to drill and ready to spud-in is Bankline Oil Company's Heise No. 1 wildcat on Section 26-4n-23w in the Ojai sector in Ventura County. Atlantic Drilling Company will take the well down under contract to about 6000 feet.

Santa Fe Springs Well Finds No Oil

Having encountered nothing of commercial interest to 7997 feet, Bell Petroleum Company's Bell-Union No. 112 on Section 31-2s-11w in the Santa Fe Springs field has gone the way of all dusters.

West Newport Well Finaled

Completed for 44 barrels of 20 gravity oil a day, cutting initially 18 per cent, Lamb Oil Company's Walter No. 1 on Section 6-6s-10w in the West Newport field in Orange County was carried to a total depth of 6582 feet before it was plugged back to 5607 feet for final test.

Deer Creek Test Dusty

A duster to a total depth of 4005 feet wrote off Western Gulf Oil Company's Clement No. 1 wildcat well on Section 29-8s-2w at Deer Creek in Santa Cruz County.

Bisti Field Test Discussed

A combination of interests, made up of Southern Union Gas Company, Northwest Production Company and Ted Fannin & Associates are understood considering the drilling of a wildcat test south of Bisti-Gallup production. Tentative location has been chosen on Section 9-24n-10w.

Saticoy Wildcat Drilling On Down

Standard Oil of California is drilling at a comparatively shallow level with its Lloyd-Butler No. 1 wildcat project on Section 5-2n-21w and one mile southeast of the Saticoy field in Ventura County. In the Bardsdale area, Camay Drilling Company has been awarded contract to drill Irwin-Beryl-wood No. 4 test on Section 1-3n-20w for Union Oil Company. Camay also will drill Union's San Marino-Robertson No. 29 on Section 12-3n-20w in the Bardsdale field.

Chino Well Written Off

Les Cal Company and J. W. Wood, Operator, have abandoned at 2961 feet their Greening No. 1 wildcat on Section 27-2s-8w in the Chino area of San Bernardino County. Joshua Hill of California, Oil & Petroleum, Inc., which has a program of several drilling jobs in the Mojave desert, has abandoned its Rickey No. 1 there on Section 16 at an approximate depth of 1700 feet.

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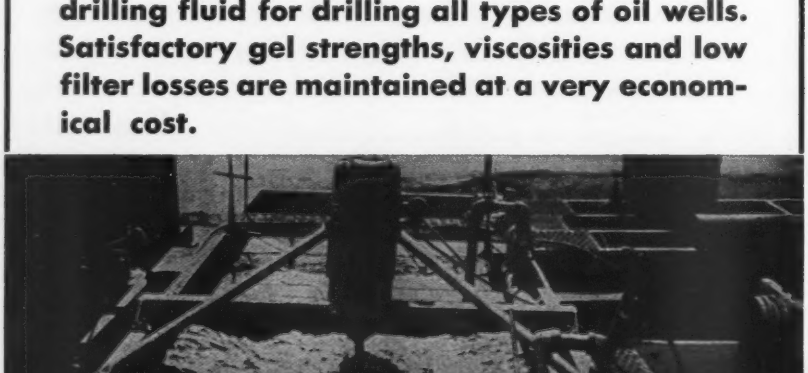

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Devils Den Test Quits

James Ebert's Finis No. 1 test on Section 9-25s-19e in the Devils Den sector of Kern County has been abandoned at 2719 feet. Surface pipe was set at 200 feet. The John F. Wilcox, Operator, JMC No. 1 on the section is idle at 40 feet.

Blackwells Test Given Final Touch

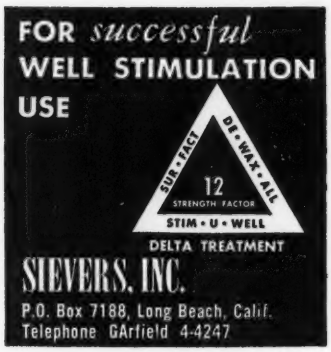
On Section 18-26s-19e at Blackwells Corner in Kern County, Macrate Oil Company's Cherry No. 4 has been completed at 633 feet for an initial and last reported yield of two barrels of 16 gravity oil a day, cutting one-tenth of one per cent. The Agua was topped at 480 feet, and the Santos at 603 feet.

San Gregorio Wildcat Digs

Drilling is proceeding normally at an approximate depth of 2000 feet with Woock No. 1 wildcat test on Section 23-7s-5w at San Gregorio in San Mateo County and sponsored by M. J. & O., Inc. The company's Whisnant No. 1 test on Section 22 was abandoned at 2490 feet. Location for Lener No. 1 has been made on Section 24.

Navajo Country Needs Highways

As the development of oil in the general Four Corners region continues to zoom upward, the need for more roads to speed the progress of oil becomes more evident day by day. In the brilliant and semi-arid Navajo Indian country in northeastern Arizona, southeastern Utah and northwestern New Mexico, there is less than 200 miles of surfaced roads in the 24,000-mile Navajo Reservation. No plans have been drawn to bring about adequate service to the area as yet with the exception of a proposal that calls for 22 miles of improved highway from Shiprock, New Mexico, west of the Arizona state line. The line comes to an end in Arizona at a point south of the Four Corners and south of the San Juan River. The Navajos numbered 18,000 in 1868. The tribe has grown steadily since then and now numbers 62,000. They are the largest Indian tribe in the country.



Reef Ridge Test Headed For Tremblor

Verde Enterprises as operator for Mariposa Company is moving steadily ahead toward target depth of 7000 feet with Mouren No. 81-X wildcat for a test of the Temblor sand zone. The drill site is 514 feet south and 339 feet west from the northeast corner of Section 16-23s-17e at Reef Ridge in Kings County. The Pyramid Hills sector of the county has added a duster, drilled by Jamieson-West Company on Section 33-24s-18e to 2259 feet and known as Orchard Bea No. 1. The McLure was topped at 2074 feet.

Steele Adds Good Mount Poso Producer

Steele Petroleum Company's new Bowles No. 3 well on Section 29-26s-28e in the northwest sector of the main Mount Poso field is currently producing 93 barrels of 15.8 gravity oil a day from a total depth of 1753 feet and cutting about three per cent. The Pyramid Hills zone was topped at 1695 feet, and the Veddar at 1733 feet. The company completed Bowles No. 1 last August as a new fault block discovery. It was completed on the pump for 85 barrels of clean 14 gravity oil a day from a total depth of 1713 feet.

Belgian Anticline Outpost Producing

Ohio Oil Company's F. E. Smith Government No. 6 Belgian Anticline field outpost well on Section 14-30s-21e is currently putting out 523 barrels of 36.9 gravity oil a day through a 16/64-inch bean and cutting less than two-tenths of one per cent from a plugged depth of 6112 feet. Success at this location extended production a quarter-mile north of other wells on the lease. The well started off at a rate near 1200 barrels daily. Hagestad Drilling Company guided the well to prosperity.

Vallecitos Test Drilling Steadily

Franco Western Oil Company's Ashurst No. 17-28 wildcat project on Section 28-16s-11e near Vallecitos in San Benito County is making hole ahead below 1100 feet. Location is northeast by about three-quarters of a mile from a company completion a year ago at 3313-3338 feet for a half-hundred barrels of oil a day. Plans for deepening from present depth of 6508 feet to 8500 feet have been mapped out for Artnell Oil Company's Ashurst No. 3-5 explorer on Section 5-17s-11e.

Navajo Tribal Lands Leases Sale Slated

Notices of sale of oil and gas leases on Navajo tribal and allotted lands have been placed in the mail during recent weeks. They embrace a total of 380,000 acres of Indian territory and a stipulated royalty of 16-2/3 per cent. The 1/6th royalty is something new in royalties and takes the place of the former royalty provision of ⅛th. This marks the first time the Navajos have asked for the higher royalty, although the Osage Indians have successfully negotiated royalties as high as 25 per cent in some instances. The present offering is the largest sale of Indian lands in years and spreads over acreage in the southeastern part of Utah and the northeastern portion of Arizona. Opening dates for bids will be December 10, 1957, January 15, February 11 and March 19, 1958.

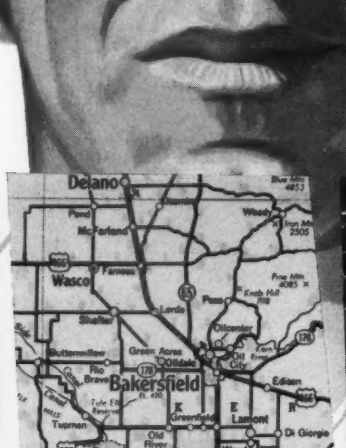
Shale Area Well Quits At 8681 Ft.

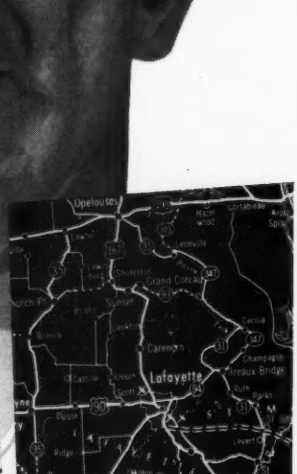
Having drilled to a total depth of 8681 feet and taken a final check with electric log to bottom, The Texas Company has abandoned its CCMO B (NCT-2) No. 1 extension test on Section 22-31s-22e in the Shale area of Kern County.

Round Mountain Test Written Off

Sol Posner as operator for National Tungsten Corporation has abandoned Marlene No. 1 Round Mountain field extension test at 1960 feet on Section 16-28s-29e. Electric log was run to 1785 feet.

Wherever you see these





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Wheeler Ridge Well On Production

Richfield Oil Corporation's ROC-KCL G No. 34-27 well on Section 27-11n-20w in the Wheeler Ridge field is in from 8940 feet for a last reported yield of 197 barrels of 38.8 gravity oil and 180,000 cubic feet of gas a day. Located less than a quarter-mile southeast of a new fault block discovery scored by the company last March, the new producer is tapping for the Vedder sand.

Piru Canyon Test Drills

Harold C. Morton and H. S. Kohlbush are nearing target depth of some 4000 feet with their Engman No. 1 wildcat test on Section 14-5n-18w at Piru Canyon in Los Angeles County. Oil has been showing since a relatively shallow depth and the upper zones may be tested at a later date. Atlantic Drilling Company is putting the well down under contract.

Riverside Well Quits

Exploration undertaken by Prosper D. Smith with Smith & Scott No. 2 well on Section 19-2s-6w in the Riverside area of Riverside County evidently has come to an end around 625 feet. Northwest of Corona, J. B. Nelson as operator will drill U. S. No. 1 test on Section 22-3s-7w.

Offshore Drilling Platform Constructed

A contract totaling about $75,000,000 has been awarded National Steel & Shipbuilding Company of San Diego by Standard Oil of California for the building of California's first offshore permanent drilling platform. The contract only covers the building of the basic platform and does not include the superstructure and all other types of equipment. Standard announced that completion is due in May of 1958 and before the ensuing fall the platform will be towed to the Standard-Humble lease near Summerland in Santa Barbara County. The two companies divide in interest in the lease, which they won with a bonus bid of $7,250,000. Standard will be the actual operator. When the platform goes into formal action it will be fully capable of drilling 25 wells and at a rate of two at a time. The entire cost of the drilling platform is in the neighborhood of $2,000,000.

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Shiells Canyon Deeper Zone Opened

Last reported production of Elkins No. 16 deeper zone discovery well at Shiells Canyon in Ventura County was 100 barrels of 30 gravity oil, cutting 2.5 per cent, along with 46,000 cubic feet of gas daily. The Texas Company drilled the well to a total depth of 7548 feet, cemented 7-inch casing at 7430 feet and plugged back to 7390 feet for final tests.

Half Moon Bay Wildcat Started

Cann & Wallis has set in motion its Elkus No. 1 wildcat project on Section 15-6s-5w in San Mateo County's Half Moon Bay sector. Target depth is 2500 feet or so. Some 25 years ago Mid-State Oil Company drilled within one mile west of the current test and was credited with finding some high gravity oil. Oil was first discovered in the area back in 1886 by Buckthorn Oil Company.

Imperial County Wildcat Planned

Imperial County has attracted new wildcat drilling interest with the latest operations in this category planned by Kent Imperial Corporation with Sinclair No. 1 venture on Section 10-12s-13 or five miles northwest of Calipatria and the same distance southeast of the Salton Sea. Contract for taking the well down has been assigned Barnes Core Drilling Company. The operator's address is given as care of Carl Martin, 3834 Opal Avenue, Grand Rapids, Michigan.

Ventura Avenue Deep Test Listed

Tidewater Oil Company's forthcoming deep test, Lloyd No. 185, in the Ventura Avenue field in Ventura County, may be taken to 17,000 feet, depending on what may come to light on the way down. It will be a contract job. Location will be 80 feet south and 7300 feet east from RCL Corner 11.

King City Test Drilling Ahead

Marport Oil Company's Marport-Mozzini Block No. 4 wildcat venture on Section 11-20s-7e near King City in Monterey County is drilling around 1000 feet. The company in the last month or two has put down two shallow tests of which one was abandoned. Marport Mozzini No. 2 on the section is down 3073 feet and being tested on the pump.

Whiskey Slough Test Redrilling

No entry was evident on test of Arcady Oil Company's Speckman No. 1-9 wildcat at Whiskey Slough and bottomed at 5350 feet. This reaction of the test of the project, on Section 9-1n-5e, was followed by pulling 5½-inch pipe from 2014 feet, plugging at that point and setting whipstock for redrilling operations. The well on its second time down at last reports was nearing original target depth.

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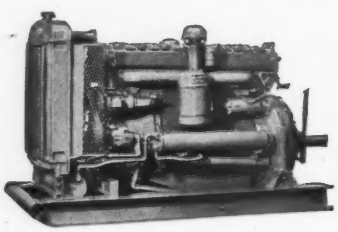

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West Biggs Test Drilling

Drilling is near the 2000-foot mark with Humble Oil & Refining Company's Lulu B. Maes No. 1 wildcat test on Section 11-18n-1e in the West Biggs area of Butte County. In the Colusa area of Colusa County, Humble's Humble-Honolulu-Anita F. Cox Unit 1 No. 1 project on Section 19-17n-1w has been given up at 3500 feet. Standard Oil's C. L. Floto No. 3 explorer on Section 27-3n-3e at Rio Vista in Contra Costa County went into abandonment at 4200 feet.

Bellevue Wildcat Drilling Stopped

One-half mile south of Kern County's Bellevue field, R. F. Oakes and F. W. Combs et el have abandoned their Continental Quinn No. 1 wildcat test at 7500 feet. The well, on Section 2-30s-26e, was a play for Steven sand production, a source of oil in the Bellevue field and where a dozen wells are putting out about a half-thousand barrels of oil a day.

Kern River Wells Go On Production

Crestmont Oil Company has finaled three wells on its May Fee lease in the Kern River field for a combined daily production of more than 200 barrels a day. They are No. 10, No. 11 and No. 12 on Section 8-29s-28e. They are bottomed respectively at 1290 feet, 1265 feet and 1240 feet.

Pleito Hills Wildcat Active

Drilling is proceeding near 2500 feet with Shell Oil Company's KCL No. 18X-2 wildcat test on Section 2-10n-21w in the Pleito Hills in Kern County. Location is two miles southwest of the company's KCL No. 48-25 discovery well, which was drilled to 13,800 feet and given the concluding touch at 11,270-11,673 feet for 100 barrels of oil daily, cutting 18 per cent.

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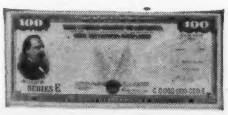

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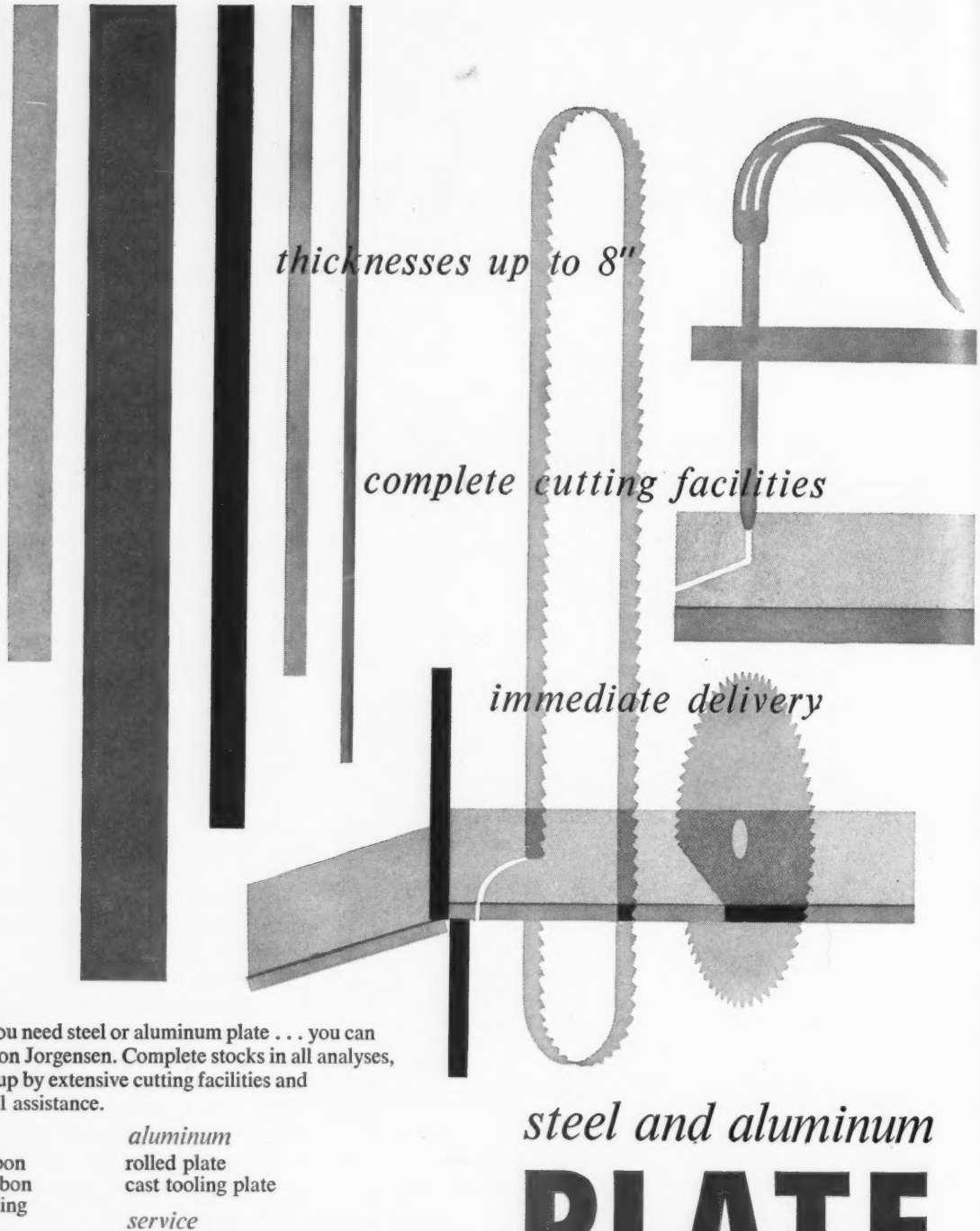

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Rocky Mountain NEWS

Colorado—Idaho—Montana—New Mexico—Utah—Wyoming—Western Canada

Wyoming

True Oil Co. has brought in a producer in the Donkey Creek field area of southwestern Crook County, but separated from the field by dry holes. The successful wildcat, producing from the Dakota, is Samuel Koch No. 2, c nw nw 20-49n-68w. A drillstem test at 6505-63 feet yielded a flow of 40.3 gravity oil. The well was drilled to 6580 feet total depth, with the Dakota topped at 6476 feet. The operation represents a new field. Nearest Dakota production is a mile to the north. No gauge was taken, but it was announced that the tool was open two hours, shut in 30 minutes, with gas to the surface in 27 minutes and oil in 35 minutes. Oil flowed the remainder of the test.

Tennessee Gas Transmission has released a pump gauge on the No. 1 Schrantz, c nw ne 33-47n-91w, of 150 barrels of oil per day. Production was obtained through perforations opposite the Phosphoria at the interval 10,185-206 feet. The producer is in Washakie County and is two miles southwest of the important Cottonwood Creek field, which also produces from the Phosphoria.

Sinclair Oil & Gas has spotted a Parkman test at the No. 1 Ohman, c nw se 32-46n-73w, Campbell County. Although a wildcat, it is in an area where other Parkman production, a member of the Mesaverde, has been obtained.

In the North Donkey Creek area of Cook County, Sinclair Oil & Gas will drill the No. 1 Prazma, c nw nw 20-50n-68w, scheduled for about 7700 feet to test the Minnelusa.

Farmer's Union Central Exchange has found slight oil shows at the No. 1 State-A, c ne ne 13-54n-82w, Sheridan County. The wildcat is scheduled to test the Ash Creek at 8700 feet.

In Weston County, Anschutz Drilling will test the Morrison, at about 7000 feet, at the No. 1 State, c sw ne 6-48n-68w. It is located four miles south of Donkey Creek field production.

Shell Oil has abandoned a Parkman test in Johnson County, the No. 14-11 Govt., sw sw 11-51n-77w, at 6920 feet total depth. Although oil was recovered on test, there was a preponderance of water.

Tank batteries are under construction at Wamsutter, together with a system of gathering lines, to take care of crude from the Table Rock field. The company has several shut-in wells in the field.

W. F. Rogers Drilling Co. of Scottsbluff, Nebr., has announced a four-well series of Parkman tests in Goshen County. They will go to 4200 feet.

Colorado

Following heavy oil production on a drillstem test of the Muddy, Continental Oil Co. is drilling ahead for tests of the Dakota and Morrison at the No. 1 Sherman-B, ne nw se 13-9n-79w, in Jackson County. Operator recovered 5200 feet of oil in a 90-minute test at 6186-6222 feet. The well is on the south end of the North McCallum field, which has not previously produced from the Muddy. Production in the field has been from the Dakota and Morrison.

Texota Oil recovered 1440 feet of oil and 720 feet of oil cut mud in a one-hour test of the J sand at the No. 1 Iven, c sw sw 11-7n-57w, Weld County. The test was taken at 6080-85½ feet. The well is in wildcat territory and is the first of a series of five scheduled by the operator on a farmout from Skelly Oil Co. They will be drilled in Weld and Morgan Counties.

Colorado's deepest well, drilled to 17,033 feet in the Weber formation, has been completed in the Fort Union. Phillips Petroleum Co. obtained a flow of 7,800,000 cubic feet of gas per day from the Fort Union, through perforations at 4043-63 feet. The well is the No. 1 Mannel, nw nw ne 27-1n-

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95w, Rio Blanco County. It is the initial test of the Powell Park Unit near the town of Meeker.

Ray Smith Drilling Co. is drilling a test of the Paradox at the No. 1 Brown, c nw se 13-40n-13w, Dolores County. It will go to 6000 feet.

In Larimer County, Arrowhead Exploration recovered oil from the No. 1 Welty, a wildcat in c nw se 33-4n-69w. Twenty barrels of oil and 11 barrels of water were recovered through perforations of the Codell-Timpas at 4492-4516 feet.

Argo Oil has found shows of both oil and gas at the No. 1 Govt.-Chorney, se nw 35-1n-103w, Rio Blanco County. Operator is coring at about 9770 feet.

Thomas I. Nabers and Associates, who drilled a Paradox test at the No. 1 Rowley, se sw 9-36n-18w, Montezuma County, have abandoned the venture.

New Mexico

Humble Oil & Refining found water in the Dakota at the No. 3 Tanner Unit, c ne ne 5-23n-12w, San Juan County. Operator has plugged back to the Mesaverde, where a drillstem test found interesting oil shows. Humble drilled two other wells in the vicinity. The No. 1 Tanner, two miles north, pumped at the rate of nine barrels of oil per day on completion. The No. 2 Tanner was abandoned when salt water was found in the Dakota.

Honolulu Oil found oil shows in the Dakota at the No. 1 Jicarilla-A, sw ne ne 26-26n-3w, Rio Arriba County. The drillstem test was taken at 8224-8309 feet. A core with oil show was cut at 8298-8323 feet. There is no other Dakota production within seven miles of the wildcat.

Skelly Oil, drilling at the No. 1 Davis, sw ne ne 26-26n-11w, San Juan County, found oil shows in a core at 6126-77 feet. The well is being drilled as a Dakota test, and although tops have not been announced, the core appears to have been taken in that zone.

Skelly has completed a confirmation to its Hospah discovery in Rio Arriba County. The confirmation, the No. 3 Jicarilla-B, c nw nw 5-24n-5w, flowed 157 barrels of oil per day through 3/4 inch choke. The well was drilled to the Dakota but plugged back to Hospah for completion.

Gulf Oil found some crude production in the Gallup at an offset drilled to a gas discovery in San Juan County by the same operator. Gulf has installed pump at the confirmation, the No. 1 Kinebato, c ne ne 21-24n-9w, where operator swabbed eight and one half barrels of oil in a 12-hour test. It offsets the No. 1-X Huerfano-Federal w½ sw sw 15-24n-9w.

Utah

Carter Oil, drilling an offset to the Tohonadla producer drilled by Shell, swabbed oil at the rate of 120 barrels per day, along with 84 barrels of water per day, at the No. 1 Navajo-23, c ne ne 2-42s-21e, San Juan County. Production was obtained through perforations opposite the Hermosa A zone. Pan American Petroleum Corp. found no shows in the No. 1 Bears Ears Unit, c se se 17-36s-19e, San Juan County, and abandoned the wildcat after drilling to 3590 feet total depth. This was the first test of the unit.

Renwar Oil has announced location for a southwestern offset to Pan American's discovery at the No. 1

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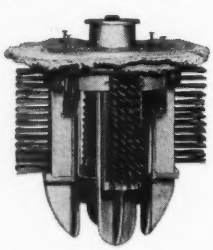

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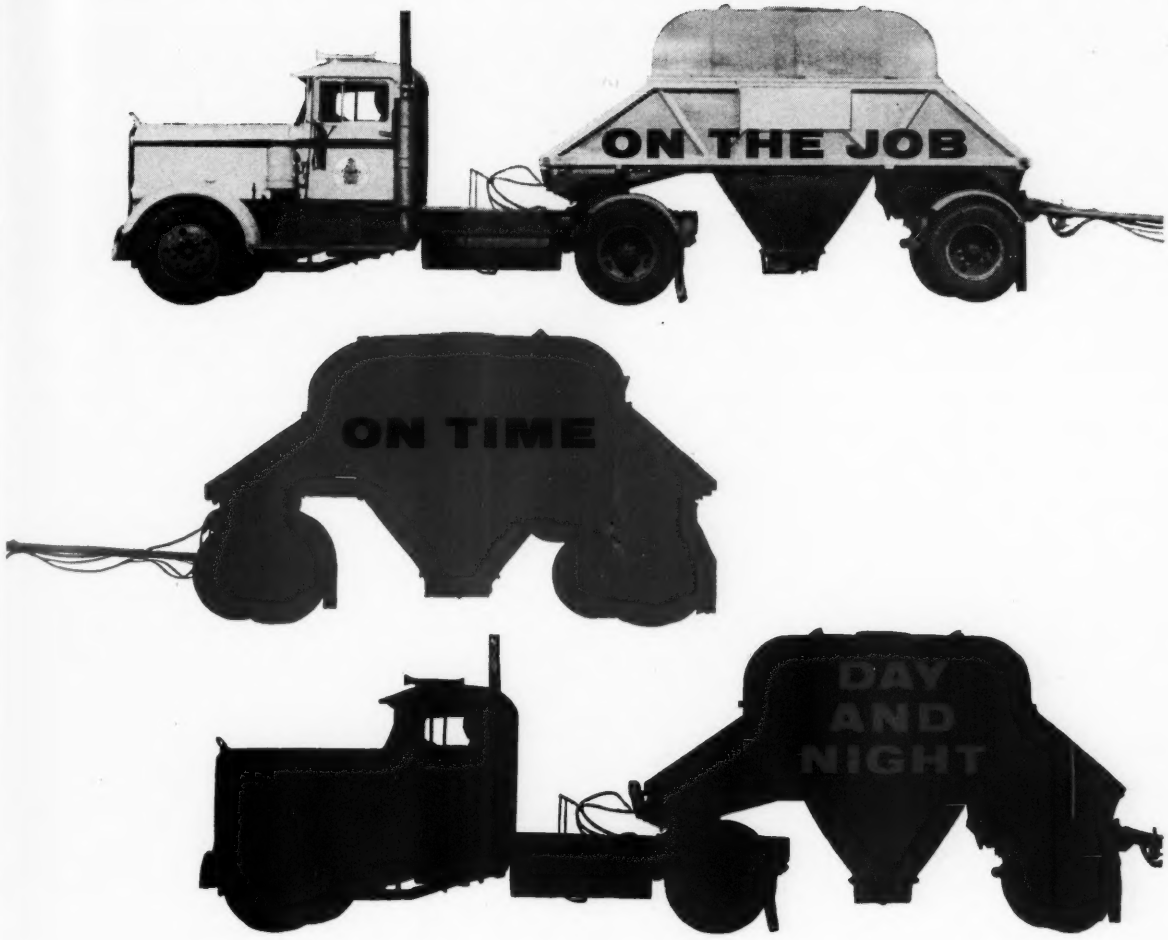

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Featherstone in the Turner Bluff area of San Juan County. The intended confirmation will be the No. 1 Federal, c ne se 13-40s-22e. Pan American's discovery flowed 192 barrels of oil per day through choke from the Ismay formation at 5405-36 feet. The confirmation is scheduled to go into that zone, with objective depth 5670 feet.

Standard Oil of California has found some shows in cores at the No. 1 Lookout Point, c se sw 29-25s-16e, Emery County. This is the first test of a unit of nearly 19,000 acres.

Carter Oil is undertaking an extensive development of the McElmo Creek field in San Juan County. The discovery well in this area, the No. 1 Navajo-114, sw nw nw 8-41s-25e, flowed at the rate of 2330 barrels of oil per day from the Paradox. Two other producers have been completed since that time. The new wells will be drilled south and east. No information has been released on some other wells drilled west of the discovery.

Nebraska

James M. Cline Oil Co. has installed pump at its Dundy County producer, the No. 1 Jones, c se nw 21-1n-37w, where operator swabbed nine barrels of oil per hour on a 24-hour test of the Lansing-Kansas City formation. Recovery was obtained through perforations at the interval 4175-87 feet. The well was drilled to 4600 feet total depth. The location is close to the Kansas state line.

Chandler and Simpson are continuing to core at the No. 1 Otto, c nw sw 12-17n-56w, Banner County. Oil shows were found in a core at 6639-59 feet but a drillstem test of approximately the same interval recovered water.

Halbert & Jennings have abandoned a Scotts Bluff County wildcat, the No. 1 Roberts, c sw sw 14-22n-54w, at 4850 feet total depth. No cores or tests were taken.

In Banner County, Pan American Petroleum abandoned the No. 1 Vought, c se se 10-18n-57w, at 6699 feet total depth.

W. F. Rogers found oil in the J sand at the No. 1 Smith-A, c ne se 19-17n-56w, an extension of the Smith field in Banner County. The test, taken at 6726-38 feet, yielded 3720 feet of oil. The J sand was topped at 6718 feet. It represents a new pay for the field.

North Dakota

Burke County, which has been the center of attention because of the Lignite field, has another producer in Arrowhead Exploration's No. 1 Propst, w½ se se 17-163n-92w, which flowed 56 barrels of oil per hour from the Midale-Nesson. Arrowhead's important wildcat is seven miles northwest of the Lignite field. The rate of production, through 30/64 inch choke, was obtained from perforations of intervals ranging from 6067 to 6092 feet. The producer, drilled to 6155 feet total depth, has been shut in for storage. The acreage is a farmout from Pan American Petroleum.

Northwest Oil Drilling is testing at the No. 1 Olson, c nw ne 18-162n-90w, with hole bottomed at 6315 feet total depth. Operator found oil shows in the Madison.

In McKenzie County, The Texas Co. has found oil shows in two drillstem tests at the No. 1 Wisness, c se sw 3-152n-96w. The tests were taken at 8782-8820 feet and 8851-8910 feet. The first test gave oil and gas cut mud, and the second was sulphur water with slight oil show.

Amerada Petroleum is making further tests of its Newburg field confirmation in Bottineau County, the No. 1 Henry, c nw se 16-161n-79w, which pumped 121 barrels of oil per day from the Spearfish, producing horizon of the discovery. The confirmation also found production in the Charles. The Spearfish was topped at 3190 feet and the Charles at 3384 feet. Other extensions are being drilled.

Texota Oil is running logs at the No. 1 Kubishta, nw se sw 6-138n-95w, with the wildcat at 8985 feet total depth. A slight oil show was found in a Madison core, but salt water was recovered on drillstem tests.

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South Dakota

Atlantic Refining found oil shows in a core taken at the No. 1 Knoll-State, c sw nw 16-2n-16e, Pennington County. The core was taken at 4341-91 feet.

Sam Gary has abandoned the No. 1 White, ne nw 3-10s-9e, in Fall River County, at 2180 feet total depth. No cores or tests were taken.

Montana

Amerada Petroleum Corp. is drilling an Otter test in Garfield County at the No. 1 Cherry Creek Sheep, ne ne 15-13n-37e, with objective expected at 5200 feet.

Amerada has drilled the No. 1 Johnson, w½ sw nw 33-36n-53e, Sheridan County, to 11,071 feet total depth, with no shows announced. Operator was running logs at last report.

In Dawson County, Mobil Producing is drilling a Red River test at the No. F-44-34-P, se se 34-16n-57e, spotted 11 miles east of Glendive. It will go to 10,900 feet.

Pan American Petroleum recovered a flow of 58 barrels of oil per day from the No. 1 Godden, c se se 5-33n-49e, Daniels County. Production was obtained from the Madison through perforations at 6410-14 feet. The well had been drilled to the Ordovician and plugged back.

Murphy Corp. is preparing to complete the No. 1 State, c ne se 23-37n-6w, Glacier County, where oil was recovered on drillstem tests of the Madison. The well was drilled to 3280 feet total depth. Operator set pipe to the top of the pay zone, logged at 3262 feet, and planned to complete as open hole.

PIGGYBACK PIPE LINE — Representing a unique engineering operation, this span of the new Four Corners Pipe Line crosses the Little Colorado River in the overhead trusses of an existing vehicular bridge on U. S. Highway 89 at Cameron, Arizona.
The 660-foot section of 16-inch diameter pipe weighs more than 54,000 pounds, and was installed on the bridge in a little over two weeks. Forty-foot lengths of pipe were slid into the trusses one at a time and welded together in position. The crossing is 84 feet above the stream bed at the near end and 104 feet above it at the other.
Shown surveying the finished crossing are Harold Butcher, left, and Earl Travis of Shell Pipe Line Corporation, which is building the pipe line for owners Continental Pipe Line Company, Gulf Oil Corporation, Richfield Oil Corporation, Shell Oil Company, Standard Oil Company of California and The Superior Oil Company.
When completed early in 1958, the line will move 70,000 barrels of crude daily into the Los Angeles refining area from oil fields in the Four Corners area, near the intersection of the state lines of Utah, Arizona, Colorado and New Mexico.

Teague Named AAODC President-Elect

J. U. Teague, president of Columbia Drilling Company, Houston, was named president-elect of the American Association of Oilwell Drilling Contractors, at the 17th Annual Meeting in Tulsa.

Teague will assume office January 1, 1928, for a one-year term. Present officers will continue in office until the end of the year, as a result of a revision of the AAODC By-laws approved by the Board of Directors. Jack H. Abernathy, Oklahoma City, is the incumbent president.

Teague is currently national vice president of the Association, and has been active in AAODC work for more than a decade. In previous AAODC posts, he was chairman of the Rotary Drilling Committee for three years, chairman of the Houston Chapter, vice president of the Gulf Coast area, and a director.

Teague was graduated from the Rice Institute, Houston, in 1930 with a B. S. degree, and worked for Humble Oil & Refining Company for ten years as a petroleum engineer, leaving to join Hogg Oil Company. During World War II, he served in the Navy 3½ years. He organized Columbia Drilling Company in 1949.

Frank E. Frawley, of the Frank Frawley Drilling Company, Tulsa, was elected national vice president to succeed Teague.

Other vice presidents named were: Ray Wiley, Ray Wiley Drilling Co., Carmi, Ill.—Cable Tools; Don Johnson, Carl B. King Drilling Co., Midland, Tex.—New Mexico and West Texas; J. O. McFaddin, J & M Drilling Co., Los Angeles—California; Don Slape, Don Slape Drilling Co., Olney, Ill.—Illinois, Michigan, Indiana and Kentucky; B. A. Wales, J & C Drilling Co., Refugio, Texas—Gulf Coast; Lloyd E. Pickrell, Pickrell Drilling Co., Wichita, Kansas — Central Mid-Continent; Guy E. Keith, Pioneer Drilling Co., Casper, Wyo.—Rocky Mountains; J. J. Harrigan, Standard Drilling Co., Oklahoma City—Well Servicing; Herbert Woolf, Woolf & Magee, Tyler, Tyler — Cretaceous and Tertiary Basins; B. F. Gilchrist, Gilchrist Drilling Co., Abilene—North & West Central Texas.

Re-elected were W. L. McCluskey, M. J. Delaney Company, Secretary-treasurer; Brad Mills, executive vice president; and Marion S. Church, general counsel, all of Dallas.

Lore and Lingo

(Continued from Page 16)

measurements or record of effects, but also the essentials of a reasonable comfortable existence for the working crews. How all this has been responsible for a new order of conduct and a new code of justice is evident in a rumor that has been whispered in dark corners of the derrick groves for the past several years. It is probably balderdash, but the story goes that during a field survey down in the wilds of Borneo, a member of a geophysical crew was captured and eaten by cannibals. This so incensed the president of the geophysical company that he promptly flew down to Borneo and ate a couple of cannibals just to teach them a lesson.

Approximately 150 of the petroleum industry's most charming ladies made the recent Desk and Derrick Club's Bosses Appreciation Night in Bakersfield highly successful and an event long to be remembered. Rita Brooks, Intex Oil Company, and Margaret Dunn, Petroleum Secretarial Service, were in charge.

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Dallas Firm Buys West Coast Company

A purchase agreement between two of the country's oldest industrial manufacturing firms has been announced by F. E. Wood, president of Sutton, Steele & Steele, Inc., Dallas. All outstanding stock of Overstrom and Sons, Inc., Alhambra, California, founded in 1891, has been acquired by the Dallas company, established in 1888.

Sutton, Steele & Steele, Inc., manufactures air tables and stoners, while the West Coast firm builds a complete line of vibrating screens and conveyors, and is well-known in the petroleum industry for its engineering contributions toward the development of oil well mud screens.

According to Wood, the $200,000 purchase inaugurates a fully integrated engineering, manufacturing, and sales program to cover all aspects of separations systems used in the process industries, as well as petroleum operations.

Overstrom will continue to operate in California with no changes in personnel. Officers of Sutton, Steele & Steele, Inc., are F. E. Wood president; J. F. Sullivan, vice president; and Bess Ryan Steele, secretary-treasurer.

In 1931, Sutton, Steele & Steele, Inc., was honored as the first company south of the Mason and Dixon Line to receive the John Price Wetherill Medal, created by the Franklin Institute for discovery and invention in physical science.

Today, Sutton patented equipment is manufactured in The United States, Canada, and Brazil, and distributed through a world-wide decentralized system of factory outlets and sales territories.

Davis Oil Starts White Mesa Well

Davis Oil Company of Denver is underway with its Navajo No. A-3 well in Section 27-41s-24e in the White Mesa area in San Juan County, Utah. White Mesa, formerly known as East Desert Creek, was the scene of one of the company's most important discoveries. The present drilling job is on a farmout from Continental Oil Company.

Studies in contrast like this Navajo sheepherder at a Humble Oil & Refining Company drilling rig have become increasingly numerous in the promising Four Corners area. Humble's operations in the Four Corners, the region where New Mexico, Arizona, Utah and Colorado touch borders, have confronted it with many obstacles. In this area the temperature ronges from 120° to 30 below zero. At some points the terrain is so rugged that driving one mile as the crow flies may involve covering 50 miles of twisting mountain roads.

Gas Company Sells Outfits

Due to the fact that contract tools are available in the area, El Paso Natural Gas Company has sold its four drilling rigs in the San Juan Basin area of Utah. San Juan Drilling Company purchased two rotaries, and Claude Carroll Drilling Company and Great Western Drilling Company, one each.

Lateral Lines Slated Links To Four Corners

Development by Continental Oil Company in the White Mesa field, San Juan County, Utah, warrants the building of lateral lines to the Four Corners Pipeline Company's carrier, which by January will send on its way 70,000 barrels of oil daily from producing areas in Utah and New Mexico. Conoco, by the way, to date has completed seven producing wells on 10,000 acres of leases in the White Mesa field.

Byron Wildcat Test Drilling

A wildcat project of considerable interest has been set in motion by Davidor & Davidor in projected Section 19-1s-3e at Byron in Contra Costa County. The well, Louis Souza No. 1, is drilling toward objective depth of 6500 feet, with B J & M Drilling Company in charge. Closest tests to this location were Shell Oil Company's Nissen No. 1, and Standard Oil Company of California's Sproule No. 1. The former was three and one-half miles south of the current venture and came to naught at 6564 feet. The latter was four miles northeast of present activity and quit at 6070 feet. December, 1941, and December, 1949, marked the end of these earlier wildcats. The Pablo area in the county, incidentally, was the scene of the second well actually drilled in California and that was way back in 1862.

Skelly Oil Programs Four Corners Drilling

Skelly Oil Company has mapped out 31 locations in the Four Corners area for drilling in the next two or three months. Included in the program are two wildcats in which interest is shared with Sinclair Oil & Gas Company. These projects are located in Township 21n-5w and 22n-4w, New Mexico.

THIS LAUGH

OFF!!

A penny pinching couple took their infant with them to a movie. The usher warned them unless the baby remained quiet, the management would refund their money and ask them to leave.

Near the end of the feature, the husband nudged his wife and whispered; "What do you think of it?"

"Terrible," she replied.

"Check," he agreed. "Pinch the baby."

A Texas oilman visiting in Pittsburgh made a phone call and screamed his head off when the operator told him the charge was 60 cents.

"What?" he roared. "Back in Odessa, Texas, I could talk to hell an back for 60 cents!"

"Maybe so," the operator replied. "But from Odessa that would be a local call."

The lady was visiting a mink farm .... Wishing to display her profound interest in the fur business she asked brightly, "And how many mink skins do you get from each animal?"

"Only one, lady," was the response ... "if we try to skin them twice it makes them, nervous."

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Found that she was getting fatter and fatter.

But she dieted so well that she now looks like hell,

And there isn't a place you can patter.

The drunk staggered from deck to stateroom, sat down, and peered through the porthole the entire afternoon. Finally he got up, turned his back, and mumbled, "What a lousy television show."

A greaseman just starting on his career of dates remarked to the girl. "I went out with a nurse yesterday."

"Never mind," she replied. "Perhaps in a year or two your mother will let you out without one."

"What makes you think your wife is getting tired of you?"

"Every day this week she's wrapped my lunch in a road map."

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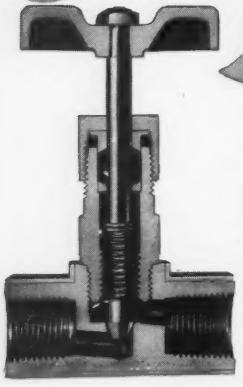

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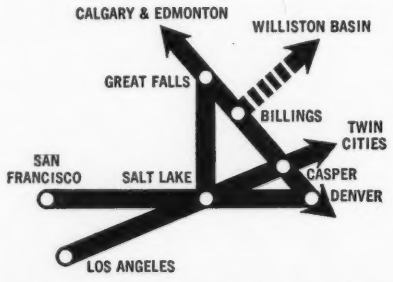

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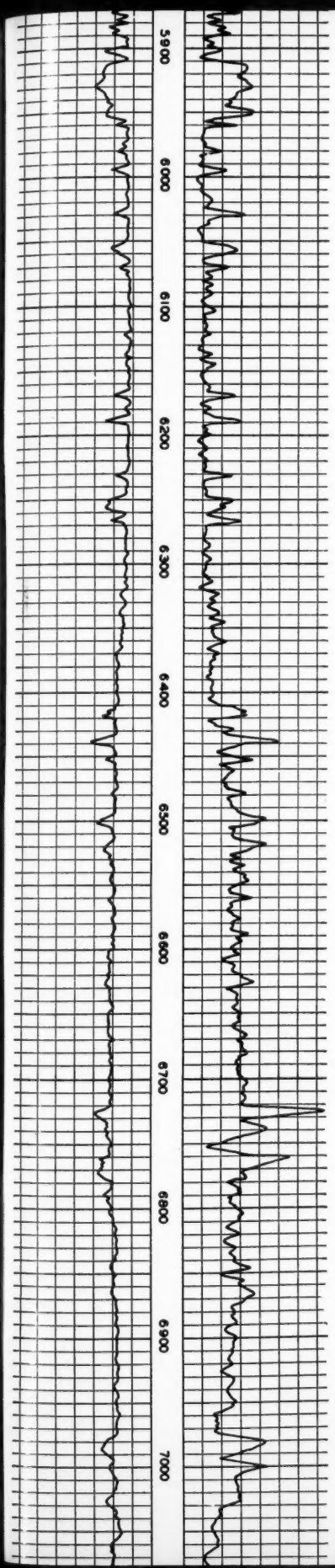

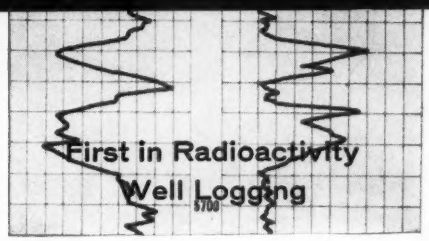

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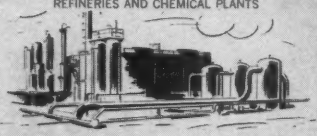

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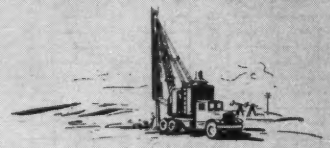

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